JAN 27 1937

We Wish—That Your 1936 Christmas Has Been Joyful, and Hope—You Will Share Liberally in Good Health and Prosperity during 1937.

Vol. XXV, No. 12 DECEMBER, 1936

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

CONTENTS

Frontispiece and Sketch—Theodore James Bradley 1097
Editorial:
- The A. Ph. A. Recipe Book II 1099
- Fair Trade Decision by U. S. Supreme Court 1100
- National Pharmacy Week 1101

Scientific Section:
- Stabilized Syrup of Ferrous Iodide—Burrin, Worton and Bibbins 1102
- The Decomposition of Solutions of Sodium Sulfide—Bulfer, Boyle and Baldinger 1104
- Comparison of the Toxicity of Neoarsphenamine to Different Strains of Rats—Sampson and Latven 1106
- A Study of Solution of Magnesium Citrate—Osol and Tice 1108
- Daphnia—The Biological Reagent—Viehoever 1112
- Antiseptics: A Comparative Study of Laboratory and Practical Tests—Reddish 1117
- A Study of Glycerin Suppositories—Prout 1123
- The Determination of Phenolphthalein in Mineral Oil Emulsions—Bickford and Schoetzow 1128
- The Clinic Pharmacy—Nichols 1129
- The Principles for Correct Prescription Pricing—Secord 1132
- Syrup of Ammonium Mandelate—Fantus and Sisson 1138
- The Next Step—Rudd 1140
- Dr. Charles Rice—Lloyd 1143
- A Uniform Schedule for Prescription Pricing in South Dakota—Eidsmoe 1146

The Department of the American Association of Colleges of Pharmacy:
- Preliminary Chemical Investigation of the Berries of Rhus Glabra Linné—McFadden and McMurray 1154
- Drug Collecting and Cultivation in Mississippi—Barkley 1156

Proceedings of the Local Branches 1160
The Pharmacopœial Hearing—Cook 1165
Marine Hospitals and Beneficiaries of the Public Health Service 1166
Committee Reports:
- Report on the National Formulary—Gathercoal 1168
- Report of the Committee to Study Courses in the History of Pharmacy 1172
- Report of the Committee for the Collection of Information Pertaining to Professional Pharmacy 1177

Association Business 1178
Editorial Notes 1181
Personal and News Items 1183
Obituary 1184
Societies and Colleges 1185
Book Notices and Reviews 1188
Index III
Pharmaceutical Abstracts and Index 513–600
Advertising—Cover Pages 2, 3 and 4 and pp. I–XII.

Published Monthly by the American Pharmaceutical Association: Office of Publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 2215 Constitution Ave., Washington, D. C. Annual Subscription, $4.00; Canada, $4.35; Other Foreign, $4.50; Single Numbers, 35 cents; Canada, 40 cents; Other Foreign, 50 cents.

THE 85th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN NEW YORK CITY—Date and Headquarters to Be Selected.

Local Secretary, Hugo H. Schaefer, 115 W. 68th St., New York, N. Y.

The 1937 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in New York.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the act of March 3, 1879. Acceptance for mailing at a special rate of postage provided for in section 1103 Act of October 3, 1917; authorized July 10, 1918.

HOLADIN

An Extract of the Entire Pancreas Gland

Holadin has long proved a definite resource in pancreatic disorders, diseases associated therewith. Holadin is put up in powder in 1 oz. vials, no "directions;" as commonly prescribed, the pharmacist may readily attach the usual prescription label.

FAIRCHILD BROS. & FOSTER

New York

APPLICATION FOR MEMBERSHIP

IN THE

American Pharmaceutical Association

Approving the objects of the American Pharmaceutical Association, I hereby apply for membership in the Association and subscribe for the "Journal of the American Pharmaceutical Association," and enclose $5.00 as annual membership dues, $4.00 of which is for a year's subscription to the Journal.

Name in Full.....

(Write or print name in full—Initials are not sufficient)

Number and Street.....

Date..... Town..... State.....

Paid $..... No.....

This application with the first year's payment of $5.00 may be sent to the Chairman of the Membership Committee, the Secretary or any officer of the A. Ph. A.

E. F. KELLY, Secretary,
2215 Constitution Ave.,
Washington, D. C.

AMERICAN PHARMACEUTICAL ASSOCIATION

SUPPLY OF MEDICAMENTS IN EUROPEAN COUNTRIES.*

In the autumn of 1935 the Secretariat of the Société Suisse de Pharmacie sent out a questionnaire to various foreign pharmaceutical societies on the supply of medicaments by medical men. In the course of a few months sixteen replies were received. The results of this referendum (*Journal de Pharmacie de Belgique*, 27, 36), are summarized below, with conditions in Switzerland added for the sake of completeness.

Austria.—Authorization to open a "medical pharmacy" is granted to doctors only where there is no pharmacy. This authorization is withdrawn when a pharmacy is opened.

Belgium.—Supply of medicaments by doctors is permitted in what is called the "plat pays" (small villages and rural communes). New regulations are under consideration.

Denmark.—When there is no pharmacy in the district, doctors can obtain permission to supply medicaments and dressings to patients. These must be purchased at a pharmacy specified by the Ministry.

Esthonia.—Doctors have not the right to supply medicaments to patients.

France.—The supply of medicaments is regulated by an Act dated April 11, 1803, still in force. The tribunals have interpreted this Act to mean that doctors at a great distance from a pharmacy may supply medicaments to their patients.

Germany.—Generally speaking, doctors have not the right to sell medicaments. They may use them, but may not leave them at the disposal of patients. A regulation, now under revision, allows doctors one league distant from the nearest pharmacy to open a "medical pharmacy" if a license is obtained.

Great Britain.—Medicaments may be supplied by doctors except under the National Health Insurance scheme. Insured persons obtain their medicaments from a pharmacy.

Hungary.—Only the doctor who lives "many" kilometers from a pharmacy has the right to have a pharmaceutical chest (Handapotheke).

Italy.—Only in communes without a pharmacy are doctors authorized to keep a pharmaceutical department.

Jugo-Slavia.—Doctors are forbidden to supply medicaments immediately after a pharmacy is opened in the district. Otherwise a "medical pharmacy" may be kept; but the medicaments must be purchased at a pharmacy.

Latvia.—As in Esthonia.

Lithuania.—As in Esthonia.

Luxemburg.—Where there is a pharmacy, doctors, surgeons and veterinary surgeons may not supply medicaments.

Poland.—In the region formerly under Austria, doctors may practice pharmacy if the nearest pharmacy is at least seven kilometers away. Elsewhere this is not allowed.

Spain.—In districts ten kilometers or more from a pharmacy doctors have a limited stock of medicaments. These are purchased at a pharmacy, paid for by the commune and supplied free by the doctor. The doctor may not sell medicaments.

Sweden.—Doctors may supply medicaments if distant from a pharmacy. These medicaments must be purchased by them at a pharmacy.

Switzerland.—The cantons of Bale-Ville, Argovie, Neuchatel, Vaud, Fribourg, Geneva and Tessin do not authorize the supply of medicaments by doctors. In the other cantons doctors may practice pharmacy even where there is an open pharmacy.

Glycerin Products Manufacturers will memorialize Carl Wilhelm Scheele—this year being the 150th anniversary of his death.—See JOURNAL A. PH. A. for May 1936, page 427.

Australian and New Zealand Association for the Advancement of Science, in which the pharmacists have a section, will be held at Auckland, January 12–19, 1937.

---

* Through *The Australasian Journal of Pharmacy*.—October 30, 1936.

THEODORE J. BRADLEY.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXV DECEMBER, 1936 No. 12

THEODORE JAMES BRADLEY.

Theodore James Bradley, president of the American Association of Colleges of Pharmacy, was born in Albany, New York, on August 8, 1874, of Connecticut ancestry. After attending the public schools of Albany and working for five years in Albany drug stores, he became a registered pharmacist in 1894. A year later he was graduated from the Albany College of Pharmacy (affiliated with Union University). He was appointed on the Faculty for the following session and taught there for seventeen years, serving also as executive officer for some time. Meanwhile he was lecturing on chemistry at the Albany Medical College for a part of this period and as teacher of mathematics at Albany Academy, and he did considerable analytical work for the New York State Departments of Health and Agriculture. He completed the course at Rensselaer Polytechnic Institute in 1904, receiving the degree of Bacheolor of Science, and was elected to *Sigma Xi*.

In 1912 he accepted an offer from the Massachusetts College of Pharmacy to serve as Dean and Professor of Chemistry, a position he has held ever since. He has been active in association work for many years, especially in the AMERICAN PHARMACEUTICAL ASSOCIATION, which he joined in 1896. He served it as a *vice-president* for three years and was its *president* in 1926; he has long been chairman of some of its committees. He was chairman of the Pharmaceutical Syllabus Committee for a number of years and served as secretary-treasurer of the American Association of Colleges of Pharmacy from 1917 to 1922.

Dean Bradley is a member of various pharmaceutical bodies in Massachusetts and of the American Association for the Advancement of Science, the American Chemical Society, the American Public Health Association and other professional organizations.

Just before he came to Massachusetts the honorary degree of Master of Arts was conferred upon him by Union University. In 1927 the Massachusetts College of Pharmacy added the honorary degree of Doctor of Pharmacy, and in 1933 the Philadelphia College of Pharmacy and Science conferred the honorary degree of Master in Pharmacy upon him.

In 1896, Dr. Bradley was married in Albany to Anna R. Peck. They have three children, Grace H. (now Mrs. Theodore R. Lund), Willis T. and Theodore. Their home is in Brookline, and they have a summer place at Kingston, New Hampshire.—E. J. H.

THE PASSING OF THEODORE J. BRADLEY.

When the foregoing sketch was prepared, the thought did not obtain that we would be saddened by the news of Dean Bradley's death, which occurred on December 11th, at his home in Brookline, Mass. He was taken ill in the class room, while lecturing, about a month ago, and death followed a cerebral hemorrhage.

At the Dallas meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, Professor Bradley took part in the Memorial Hour, speaking in memory of Elie Henry La Pierre; he closed his remarks with the quotation,

> "He was a man, take him for all in all,
> I shall not look upon his like again."

May we repeat these words and with the feeling expressed by the deceased on August 26th.

The sorrow which has come to those near and dear and to those with whom he labored, is greater because Mrs. Bradley has been in poor health for some time; in expressing sympathy to the family it is hoped that she may have strength to bear her great loss.

Funeral ceremonies were held at the family home in Brookline by the Rev. Oscar Hawes of the First Unitarian Church and interment was made at Albany, N. Y.

Among others the following were members of the delegation at the funeral services:

Charles H. Packard, William H. Glover, William S. Briry, Ralph R. Patch, Irving P. Gammon, Heber W. Youngken, William R. Acheson, Leon C. Ellis, Lyman W. Griffin, Samuel M. Best, N. Clark Clement, Henry A. Estabrook, J. Everett Barron, Arthur C. Morey, Daniel O. Wolff, John R. Sawyer, Charles L. Davis, Dr. Charles O. Thompson, Linville Smith, E. V. Lynn, J. Leon Thompson.

A prior sketch appears in the March 1926 JOURNAL, A. PH. A., page 159. See also page 793, and the President's Address in the September 1927, issue of the JOURNAL, page 810.

INTERNATIONAL HOSPITAL ASSOCIATION.

The International Hospital Congress will convene in Paris, July 6 to 11, 1937. The sessions will be held in the Arts and Professions Building, quite close to the World Exhibition. An Organization Committee has been formed, under the patronage of the Minister of Health for the preparation of a business and entertainment program. Papers will include subjects in French, German, Italian and English, and deal with all phases of hospital activities. Visits will be arranged to various hospitals in France including special hospitals such as for the treatment of cancer, and visits to interesting places in the vicinity of Paris, and to the Paris World Exhibition.

Secretary Sydney Lamb writes that a good attendance is expected at the Congress from the United States, and that groups have made arrangements with steamship lines whereby stop-overs are included in other parts of Europe. Arrangements are being made to have local members accompany visitors to points of interest and the Secretary, whose address is 87 Lord St., Liverpool, requests that he be advised relative to the wishes of the visitors.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

THE A. PH. A. RECIPE BOOK II.

IT WAS in the mind of the late Henry P. Hynson that the idea for publishing a Recipe Book by the AMERICAN PHARMACEUTICAL ASSOCIATION originated. It has a close relationship to the U. S. Pharmacopœia and the National Formulary which had as a purpose greater uniformity as services to the medical and pharmaceutical professions and the laity. The former was developed by medical practitioners, who recognized the need for an improved materia medica, and the latter had as a basis greater uniformity of unofficial preparations. Pharmacist Hynson recognized the importance of bringing preparations, not included in the standards, into greater uniformity by a book of formulas.

Just as physicians and pharmacists recognized the necessity of coöperation in the successive revisions of the standards, so also the activities which were benefited by the publication of the Recipe Book gave their support. This book represents the outcome of an effort of the AMERICAN PHARMACEUTICAL ASSOCIATION to place in the hands of pharmacists and others a reliable and comprehensive book of recipes applicable to pharmaceutical and related practice. This valuable undertaking has the support and joint interest in the practices represented by physicians, pharmacists, dentists, chiropodists, veterinarians and others.

The first edition of the Recipe Book was favorably received and the good judgment which prompted the useful publication was recognized by the demand for a second edition. The comprehensive list of subjects speaks for the book as an essential volume for the pharmacists' library and as a helpful reference in other professional and technical libraries. The preparations may be summarized:

Pharmaceutical Formulas, Hospital Formulas, Dental Formulas, Chiropodists Formulas, Laboratory Reagents, Veterinary Formulas, Photographic Formulas, Flavoring Formulas, Cosmetic Formulas, Vehicles, Technical and Miscellaneous Formulas, Agricultural Formulas, Industrial Formulas, First Aid, Table of Doses, Schedules of Antidotes for Poisons.

Quotations from two paragraphs of the Preface speak for the dignified position maintained by the Recipe Book, the care exercised in its publication and the recognition given it.

"The admission of formulas is dependent on a vote of two-thirds of the members of the Committee; the formulas have been tried out and include only preparations that can be compounded by the pharmacist."

"Therapeutic authority is disclaimed regarding the remedial action, and no responsibility is assumed for the therapeutic value of the formulas or the specified doses, which are average doses based upon accepted practice; and these are given both in the metric and apothecaries systems. The Recipe Book does not aim to supply imitations for proprietary or trade-marked articles, and permission has been obtained as far as possible for reprinting institutional formularies. The Recipe Book has received mention in the Standard Year Book issued by the U. S. Department of Commerce."

"The Food and Drug Administration of the Department of Agriculture has given valuable assistance in revising titles. The Council on Dental Therapeutics

of the American Dental Association has given helpful criticism; the American Veterinary Medical Association and other contributors have given help in preparing chiropodist formulas."

"The section on vehicles was compiled from information obtained, by permission, from 'Essentials of Prescription Writing' by Cary Eggleston, M.D. (through courtesy of W. B. Saunders Company) and material received from Bernard Fantus, M.D."

FAIR TRADE DECISION BY U. S. SUPREME COURT.

THE United States Supreme Court, on December 8th, upheld "Fair Trade" laws of California and Illinois. The decision, in the opinion of many observers, "opened the way for at least a partial revival of portions of the Retail Code under the National Industrial Recovery Act through State action." The court's decision was based largely on the principle, "that the trade-mark or brand of the manufacturer's product was through the operation of the principle of good-will, in itself a property right of the producer and did not pass to the retailer on the purchase of the actual merchandise." Mr. Justice Sutherland delivered the opinion of the court.

Two cases were considered on the Illinois law and two on the California statute. The opinion is expected to have a far-reaching effect on retail practices; many other states have similar laws and other states have been awaiting these decisions before taking related action. These decisions will establish a fair basis for retail prices.

The ruling amounts to a reversal of the decision of the New York State Court of Appeals in January holding Section 2 of the State Feld-Crawford Act invalid. The court drew a distinction between the right of the retailer in property bought for resale and his right in the good-will of the manufacturer as represented by his trade-mark on the merchandise. It held that title to the trade-mark did not pass and thus the manufacturer had the right to set the sale price of the merchandise and the trade-mark considered together. The court saw no authority for not holding "that prices in respect of identified goods may be fixed under legislative leave by contract between the parties." "The primary aim of the law is to protect the property—namely the good will—of the producer, which he still owns. The price restriction is adopted as an appropriate means to that perfectly legitimate end and not as an end in itself."

Justice Sutherland said, "while retailers may own a standard product, they do not own the mark or the good-will that the mark symbolizes." He said—"There is a great body of fact and opinion tending to show that price cutting by retail dealers is not only injurious to the good-will and business of the producer and distributor of identified goods, but injurious to the general public as well." "Good-will is property in a very real sense, injury to which, like injury to any other species of property, is a proper subject for legislation. Good-will is a valuable contributing aid to business—sometimes the most valuable contributing asset of the producer or distributor of commodities. And distinctive trade-marks, labels and brands are legitimate aids to the creation or enlargement of such good-will."

The decision is a most important one and will encourage legislation that protects those whose desire is to uphold "fair trade" practices.

NATIONAL PHARMACY WEEK.

THERE is much to be gained from the Oath and Prayer of Maimonides relative to the challenge of to-day, which, in part, reads as follows, "May the love for my art actuate me at all times; may neither avarice, nor miserliness, nor the thirst for glory, nor for a great reputation engage my mind."

American Pharmacy is witnessing an unprecedented change relative to the reconstruction of a new order as being built upon the ashes of chaos in an over-exploited field of commercialism.

In order to achieve those things desired it becomes necessary for all concerned to pause in this onward rush of a complex civilization for the purpose of making an inventory of stock in trade, to seek a renewal of faith and to put forth a serious attempt to peer through the fog enveloping us so as to view the situation from an intellectually honest point of view.

In substance these were the words expressed to the present Chairman by the late Dr. Robert J. Ruth a few weeks prior to his untimely death.

The Pharmacy Week movement is now entering its thirteenth year of progress. Its deeper significance is becoming to be more fully appreciated year by year as gaged by the character of the activities on the part of retail pharmacists and others of the profession.

A detailed study has been made of the various aspects of this activity as sponsored by the AMERICAN PHARMACEUTICAL ASSOCIATION and future years will witness a correction or modification of certain activities and will likewise witness newly introduced factors that will materially strengthen the entire structure.

An outstanding feature of the 1936 observance was the nationwide broadcast by Dr. George D. Beal, President, AMERICAN PHARMACEUTICAL ASSOCIATION.

A study of the photographs submitted in the Window Display Contest reveals that the professional displays, as prepared and exhibited by retail pharmacists, Colleges of Pharmacy and by pharmaceutical organizations, represent a marked improvement over those submitted in former years.

The Window Display Contest Committee is now at work to determine the retail pharmacist who will be adjudged winner of the Robert J. Ruth Memorial Trophy, as well as that College of Pharmacy and the pharmaceutical organization that will be awarded beautiful banners together with standards. This Committee will likewise determine the grants to be made in connection with the Merit Certificates as awarded jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists.—ANTON HOGSTAD, JR., *Chairman*.

OFFICERS-ELECT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1937–1938.

The Board of Canvassers of the AMERICAN PHARMACEUTICAL ASSOCIATION, composed of Edward Spease, *Chairman;* Edward D. Davy and F. J. Bacon, all of Cleveland, Ohio, has announced as the result of the mail ballot for the officers of the ASSOCIATION, the election of the following: *President-Elect*, E. N. Gathercoal, Chicago, Ill.; *First Vice-President-Elect*, W. Mac Childs, Eldorado, Kansas; *Second Vice-President-Elect*, Glenn L. Jenkins, Minneapolis, Minn.; *Members-Elect of the Council*, H. A. B. Dunning, Baltimore, Md.; S. L. Hilton, Washington, D. C.; and P. H. Costello, Cooperstown, N. Dak.

These officers will be installed at the next annual meeting of the ASSOCIATION which will be held in New York City, the time to be announced later.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins; H. M. Burlage, W. G. Crockett, E. V. Lynn, C. O. Lee, L. W. Rising, L. W. Rowe, Heber W. Youngken, F. V. Lofgren, J. C. Krantz, Jr.

STABILIZED SYRUP OF FERROUS IODIDE.*,[1]

BY P. L. BURRIN, A. G. WORTON AND F. E. BIBBINS.

Syrup of Ferrous Iodide has long been recognized as an unstable pharmaceutical product. Because of its value as a therapeutic agent, however, the medical profession has continued to prescribe it for more than a century. Certainly its use would be more extensive were it more stable.

Various methods have been advanced for stabilizing the syrup and specific directions have been given for storage conditions to retard deterioration. Considering the instability of this syrup, it is remarkable that an effective method of preservation has not been adopted before now.

Beral (1) is credited as the first to attempt stabilization of solutions of ferrous iodide. He reported the use of simple syrup as a preservative in 1841. Beral is also credited with being responsible for the introduction of Syrup of Ferrous Iodide into the United States Pharmacopœia of 1860.

In 1888, England (2), endeavoring to produce a stable product, experimented with commercial glucose, and a mixture of glucose and dextrose. These materials were found to be unsatisfactory for they did not prevent oxidation of the ferrous iodide. He is said to be the first to use powdered dextrose in compounding Syrup of Ferrous Iodide. He reported this syrup to be stable.

Braford and Langenhan (3), in 1927, made an extensive report covering all published data pertaining to Syrup of Ferrous Iodide. They reported several authorities for the use of citric acid, as a stabilizer, in a syrup made with sucrose. They also pointed out that citric acid was included in the formula for Syrup of Ferrous Iodide in the Pharmacopœias of Holland, Austria, Belgium and Hungary.

Because of the unsightly appearance of the deteriorated product, it is the common opinion that its therapeutic efficacy has been reduced. Husa and Klotz (4), however, have reported this deterioration to be confined to the sugar. They claim the darkening and precipitation in the syrup is caused by hydrolysis of the sucrose, and the ultimate decomposition of the resulting fructose. As proof for their claims they have proposed a formula for a stable syrup, which is compounded with dextrose in place of the sucrose, and contains hypophosphorous acid as the antioxidant.

The authors prepared several samples of Syrup of Ferrous Iodide, as proposed by Husa and Klotz, substituting powdered dextrose for sucrose to the point of saturation. Except for a nearly imperceptible blue-green tint, these samples could be classed as colorless. Because of the low viscosity and intensified bitter taste of the samples prepared with dextrose, it was decided to try further experiments.

---

* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] From the Control Laboratories, Eli Lilly and Company.

Seven samples were prepared containing from 28 to 56 per cent by volume of glycerin. This addition of glycerin was found not only to increase the viscosity to the desired point, but also to improve the taste. After aging for a year in half-filled, flint-glass bottles, all samples prepared with dextrose were in excellent condition; however, the control sample made without glycerin acquired a very slight yellow tint as did the samples made with the greater amounts of glycerin. The sample prepared with 28 per cent by volume of glycerin showed no discoloration whatever. The discoloration, beginning with the sample containing glycerin 36 per cent by volume, increased proportionately with the amount of glycerin. The discoloration in the control sample, prepared according to the formula proposed by Husa and Klotz, was equal to that of the sample containing 56 per cent glycerin by volume. The shade of difference in these samples after aging a year may be considered inconsequential, and is mentioned only to show that the results are not identical.

Following the work of Husa and Klotz in stabilizing solutions of ferrous iodide by raising its p_H to 3.2, an effort was made by the authors to raise the p_H of Syrup of Ferrous Iodide U. S. P. XI by using the absolute minimum quantity of hypophosphorous acid allowed in this formula. The U. S. P. XI formula specifies hypophosphorous acid containing 30 to 32 per cent acid; therefore, 30 per cent acid was used in compounding several samples. The p_H changed from 1.0 to 1.2, but the stability was not changed at all as compared to a sample containing 31 per cent acid.

In a further endeavor toward stabilization, varying amounts of citric acid were added to three samples made according to the U. S. P. XI formula. To one sample was added 0.25 per cent of citric acid, to another 0.5 per cent and to the other 1.0 per cent. The citric acid changed neither the p_H nor the stability of the product. Another sample was prepared at the same time in which 0.07 per cent of citric acid was substituted for the hypophosphorous acid. The p_H immediately after its preparation was 2.0. This sample, after aging for nearly a year, is in excellent condition, having discolored to only a pale yellow, and contains no precipitate.

At the time the samples were prepared with citric acid, another was prepared according to the formula of the U. S. P. XI with 0.5 per cent of sodium citrate added. It seems that the addition of sodium citrate evidently buffers the solution, preventing hydrolysis of the sucrose and decomposition of the hydrolytic product, fructose. This sample still retains its original light green color and is free from precipitate; consequently it may be classed as an elegant pharmaceutical after having aged for nearly a year.

In conclusion it may be said that substituting powdered dextrose for sucrose to the point of saturation in the U. S. P. XI formula for Syrup of Ferrous Iodide produces a very stable product with a low viscosity. The viscosity and the stability likewise may be increased advantageously by the addition of glycerin up to 36 per cent by volume. The chief disadvantage of this additional glycerin is the increased cost.

Stabilization of the U. S. P. XI product containing sucrose may be brought about by the simple addition of 0.5 per cent of sodium citrate or by the substitution of 0.07 per cent of citric acid for the hypophosphorous acid.

REFERENCES.

(1) Beral, *American Journal of Pharmacy*, 13, 74 (1841).
(2) England, *Ibid.*, 64, 547 (1888).
(3) Braford, C. J., Langenhan, H. A., Jour. A. Ph. A., 16, 336 (1927).
(4) Klotz, L. J., Husa, W. J., *Ibid.*, 23, 679 and 774 (1934).

THE DECOMPOSITION OF SOLUTIONS OF SODIUM SULFIDE.*

BY G. BULFER, A. J. BOYLE AND L. H. BALDINGER.[1]

INTRODUCTION.

The decomposition of sodium sulfide in aqueous solution has long been a subject of interest. Thomsen (1) has reported that a solution of sodium sulfide is almost completely hydrolyzed into sodium hydrosulfide and sodium hydroxide. This agrees with the reports of Knox, Bauer, Kolbe and others (2). Küster and Heberlein (3) showed that the hydrolysis of sodium sulfide in a tenth-normal solution occurs to the extent of 86.4% and results in the formation of sodium hydrosulfide and sodium hydroxide. They further reported the hydrolysis of sodium hydrosulfide into hydrogen sulfide and sodium hydroxide to the extent of 0.14 per cent.

Aqueous solutions of sodium sulfide are also oxidized in air with the formation of sodium thiosulfate and sodium bicarbonate. Mitscherlich (2) states that half of the sulfide is converted to the thiosulfate and half to the bicarbonate in the oxidation. Mellor (2) reported that carbon dioxide reacts with aqueous solutions of sodium sulfide converting it to sodium hydrosulfide and sodium bicarbonate. Borntrager (4), while investigating the analysis for copper using sodium sulfide solution, found that increasingly large amounts of sulfide solution were necessary as the solution became older. One sample showed 66.6% decomposition in a period of one month.

Sodium sulfide in varying concentrations, both in water solution and in paste form, can be used as a depilatory. The effectiveness of the preparations, attributed to the sulfide ion, is impaired by the decomposition of the sulfide salt in aqueous solution. Organic compounds such as glycerol and carbitol (diethyl ether of ethylene glycol)[2] have been added to depilatory preparations to inhibit decomposition. The present problem was undertaken to study briefly the effectiveness of these two compounds as inhibitors of the decomposition of sodium sulfide solutions.

ANALYTICAL PROCEDURE AND DATA.

A rapid method of analysis of alkali sulfides was desirable for the proposed work. The standard and approved method of oxidation of the sulfide to the sulfate, precipitation and determination as barium sulfate was ruled out because of the time involved. Calcott, English and Downing (5) found that a mixture of ammonium chloride and sodium chloride readily evolves hydrogen sulfide from sodium sulfide while other substances which may be present in the sodium

---

* Scientific Section, A. Ph. A., Dallas meeting, 1936.

[1] Departments of Pharmacy and Chemistry, University of Notre Dame, Notre Dame Ind.

[2] Carbon and Carbide Chemicals Corporation, New York City.

sulfide solution are not decomposed appreciably. Kurtenacker and Wollack (6) proposed a volumetric method for the determination of sulfide, sulfite and thiosulfate in a mixture, a method involving the use of formaldehyde to remove sulfite and cadmium to remove sulfide. Hall (7) has proposed a method for the determination of the components of a mixture of alkali sulfide, alkali hydrosulfide and hydrogen sulfide. The method is extremely simple and direct. Preliminary investigations seemed to indicate that little or no hydrosulfide salt was present in the solutions of sodium sulfide such as were later to be made up and studied. The amount of sodium thiosulfate formed was likewise thought to be negligible. For that reason the method proposed by Hall with a slight modification was adopted. The modification involved merely the elimination of the hydrosulfide analysis, thereby simplifying the investigation of a large number of solutions each week.

Two series of sample solutions of sodium sulfide, $Na_2S.9H_2O$, containing varying quantities of glycerol and carbitol as inhibitors were prepared. See Table I.

TABLE I.—PERCENTAGE COMPOSITION OF SOLUTIONS PREPARED FOR STUDY.

	Glycerol Series.				Carbitol Series.			
Solution No.	1	2	3	4	1	2	3	4
Sodium sulfide ($Na_2S.9H_2O$)	7	7	7	7	10	10	10	10
Glycerol	15	20	25	30				
Carbitol					15	20	25	30
Ethanol	2	2	2	2	2	2	2	2
Water	76	71	66	61	73	68	63	58

The rate of decomposition of the sulfide solutions containing inhibitors was compared to the rate of decomposition of an aqueous solution. Immediately after preparation all of the solutions were analyzed for sulfide content, and similar determinations were made at weekly intervals over a period of ten weeks. No attempt was made to shield the solutions from the effect of light and air. The partially filled bottles, glass-stoppered, were kept on the open shelves of the laboratory.

Procedure.—For each determination a 10-cc. sample was diluted to 100 cc. in a volumetric flask. Twenty-five cubic centimeters of this solution were then added, with constant stirring, to an excess of 0.1 normal iodine solution, diluted to about 400 cc., and acidified with concentrated hydrochloric acid (3 cc.). The excess iodine was then titrated with 0.1 normal sodium thiosulfate solution. The sulfide content was calculated on the basis of the iodine used. See Table II.

TABLE II.—PER CENT SODIUM SULFIDE DECOMPOSED DURING PERIOD OF TEN WEEKS.

	Glycerol Series, Weeks.					Carbitol Series, Weeks.				
Solution No.	2	4	6	8	10	2	4	6	8	10
1	2.2	4.4	5.1	5.4	12.0	3.0	4.1	4.9	6.1	8.8
2	5.0	7.3	8.2	9.6	13.0	2.0	4.6	5.4	5.9	8.3
3	6.2	13.0	15.4	15.5	16.5	2.7	3.4	4.0	5.5	7.6
4	2.0	5.5	8.6	10.4	13.0	3.0	4.0	5.6	7.6	10.0
Aqueous Solution	20.0	25.0	30.0	38.9	57.0					

CONCLUSION.

The investigation revealed that the organic substances, glycerol and carbitol, do inhibit, to some extent, the decomposition of sodium sulfide in solution. In all cases decomposition was appreciably less than in aqueous solution. From the results obtained, however, no kinetics of the decomposition reaction can be calculated. The behavior of certain solutions seems to indicate that factors other than the addition of organic material may have an effect upon the decomposition. The study is being continued.

REFERENCES.

(1) Thomsen, *Z. anorg. Chem.*, 43, 64 (1905).

(2) Mellor, "A Comprehensive Treatise on Inorganic and Theoretical Chemistry," 1st Edition, Vol. 2, page 627, Longmans, Green and Co., 1922.

(3) Küster and Heberlein, *Z. anorg. Chem.*, 43, 53 (1905).

(4) Borntrager, *Z. anal. Chem.*, 87, 345 (1931).

(5) Calcott, English and Downing, *Ind. Eng. Chem.*, 17, 176 (1925).

(6) Kurtenacker and Wollack, *Z. anorg. allgem. Chem.*, 161, 201 (1927).

(7) Treadwell and Hall, "Analytical Chemistry," 8th Edition, vol. 2, page 634, John Wiley and Sons, 1935.

COMPARISON OF THE TOXICITY OF NEOARSPHENAMINE TO DIFFERENT STRAINS OF RATS.*

BY WILLIAM L. SAMPSON AND ALBERT R. LATVEN.[1]

That individual variation with a group of test animals plays an important rôle in the determination of the toxicity of neoarsphenamine has long been recognized. Voegtlin, in his many papers on the arsphenamines, repeatedly states that "due to the great individual difference in the susceptibility of animals it is difficult to obtain a sharply defined M. L. D." Hooper, Kolls and Wright (1) in their paper on the influence of diet on the toxicity of arsphenamines direct attention to the considerable variation in individual animals to arsphenamine poisoning. Heyle, Hart and Payne (2) have shown that the M. L. D. of a single lot of neoarsphenamine varied from 320 mg. per Kg. to 440 mg. per Kg. when determined on different groups of animals from their colony. Recently Morrell and Chapman (3) in their work on the determination of the characteristic toxicity curve of neoarsphenamine for rats have found that the L. D. 50 of a single lot of neoarsphenamine when tested at intervals over a period of eight months on rats from a carefully controlled colony varied from 380 mg. per Kg. to 500 mg. per Kg.

Except for a note in a report by Hart and Payne (4), in which they mention a difference of more than 100 mg. in the M. L. D. of a single lot of neoarsphenamine as determined in two different laboratories, there appears no direct evidence of a consistent difference in the tolerance to neoarsphenamine of rats from different colonies. Inasmuch as the official method for the determination of the toxicity of neoarsphenamine as recommended by the National Institute of Health, U. S. Public Health Service (5) calls for the use of healthy albino rats without specification as to strain, it occurred to us that an investigation of albino rats from different sources might prove of interest.

Young male albino rats from three different breeding colonies, hereafter referred to as colony I, colony II and colony III, were obtained for this investigation. We elected to use only male rats to eliminate any variation due to sex. Upon arrival in the laboratory the young animals were placed on an adequate diet similar to that recommended in the official method and were maintained on this diet for one week to minimize the possible influence of sudden change of diet on the resistance of the rat. Only obviously healthy animals weighing from 90 Gm. to 110 Gm. were used in the test.

---

* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] Merck Institute of Therapeutic Research, Rahway, New Jersey.

Samples of neoarsphenamine from four different sources were purchased on the open market. Several ampuls of each lot number were obtained. Four per cent solutions of the neoarsphenamine in cooled freshly distilled water were prepared in glass-stoppered cylinders with only the minimum amount of gentle agitation necessary to assure thorough mixing. This solution was slowly injected into the saphenous vein of the test animal. A fresh solution of the drug was used for each group of 5 to 6 animals injected. In this way use of solutions more than thirty minutes old was avoided. While we are fully aware of the precautions for the preparation and preservation of neoarsphenamine as recommended by Morrell and Chapman (6), we decided to use the above procedure because we believed that it would conform more closely with the procedures in general use in other laboratories performing this particular test.

A total of 710 animals from the various colonies were used in this study. Twenty animals were injected at each dose level except in a few cases where limitation of sample permitted the use of but ten or fifteen animals.

From the results of these injections dose mortality curves for the various neoarsphenamines were constructed. Figure 1, typical of these curves, represents the results obtained for Sample C, using rats from each of the three colonies. The slopes of these curves in their middle range are in fairly good agreement with one another and illustrate quite well the difference in resistance of rats from the different colonies.

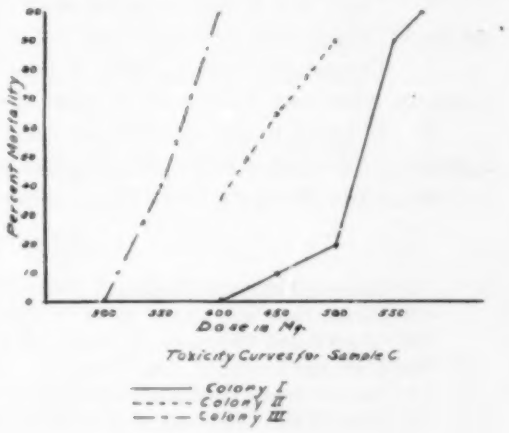


Fig. 1.

Table I gives the L. D. 50 of the various neoarsphenamines as determined with rats from each of the three colonies. Inspection of this table shows that in every case animals from colony I tolerate much larger doses of the drug than do animals from the other two colonies. Similarly it is apparent that animals from colony II have in general, a slightly greater resistance than do those from colony III. Furthermore, it is evident that the order to relative non-toxicity of the four samples remains the same for each of the three colonies. In this connection it is interesting to note that it requires but 75 per cent as much of Sample B as of Sample F to cause 50 per cent mortality in animals from colony I, 62 per cent as much to produce a similar toxicity in animals from colony II, and 68 per cent as much to effect the same results in animals from colony III. Sample C is 74 per cent as toxic as Sample B for animals for colony I, 68 per cent as toxic for animals from colony II, and 77 per cent as toxic with animals from colony III. The agreement in the relative toxicity of Samples A and B is not quite so good, being 76 per cent for colony I, 88 per cent for colony II and 96 per cent for colony III.

TABLE I.

Sample.	Colony I, L. D. 50.*	Colony II, L. D. 50.*	Colony III, L. D. 50.*
A	500 mg.	325 mg.	290 mg.
B	385 mg.	287 mg.	280 mg.
C	520 mg.	425 mg.	360 mg.
F	510 mg.	460 mg.	410 mg.

*L. D. 50 doses of various neoarsphenamines for rats from different colonies.

The results of this experiment offer evidence of a definite and consistent variation in the resistance to poisoning by neoarsphenamine of rats from different colonies. Investigating in an entirely different field Cleghorn and co-workers (7) have reported that there is a definite difference in the survival time following adrenalectomy of rats from different strains. On the other hand, Durham, Gaddum

and Marchal (8) state that while they have no actual data concerning the extent to which sensitiveness to the salvarsan group may differ with different strains of mice, "It can only be said that there is no evidence as yet of wide permanent difference in this response between stocks used in different European laboratories."

It is apparent from the foregoing data that it is not possible to make a significant comparison of toxicity among samples of neoarsphenamine when rats from different strains are used. It is equally apparent that the relative non-toxicity of several samples of neoarsphenamine may be quite accurately determined if one strain of animals is used in making the test. Hence, the determination of the toxicity of neoarsphenamine, like most biological assays, is without significance unless a physical standard of reference is used to standardize the resistance of animals from a single colony.

SUMMARY.

1. There is a definite and constant difference in the tolerance to neoarsphenamine of albino rats from different colonies.

2. The relative non-toxicity of several samples of neoarsphenamine remains constant when tested on animals from any single colony.

3. In order to standardize the resistance of animals from different colonies, a physical standard of reference, supplied by some central authority, should be used for comparison in every assay of neoarsphenamine.

REFERENCES.

(1) Hooper, Kolls and Wright, *J. Pharm. & Exper. Therap.*, 18, 133 (1921).
(2) Heyle, Hart and Payne, JOUR. A. PH. A., 12, 214 (1923).
(3) Morrell and Chapman, *J. Pharm. & Exper. Therap.*, 48, 391 (1933).
(4) Hart and Payne, *J. Am. Chem. Soc.*, 44, 1150 (1922).
(5) Miscellaneous Publications No. 22, Revised, U. S. Public Health Service (1923).
(6) Morrell and Chapman, *J. Pharm. & Exper. Therap.*, 48, 381 (1933).
(7) Cleghorn, Forster and McVicar, *J. Physiol.*, 86, 229 (1936).
(8) Durham, Gaddum and Marchal, *Spec. Report Ser.* No. 128 (1929), Med. Research Council, London, England.

A STUDY OF SOLUTION OF MAGNESIUM CITRATE.*

BY ARTHUR OSOL AND LINWOOD F. TICE.[1]

The purpose of the investigation reported in this paper was to study solution of magnesium citrate U. S. P. XI to definitely establish whether the reduction in citric acid content from 35 to 33 Gm. per bottle constituted a desirable change and assured a stable product.

It has been claimed that 33 Gm. of citric acid provided a sufficient amount to permit the preparation of a stable solution of magnesium citrate, *i. e.*, one which upon standing would not be subject to precipitation. Arny and Schaefer (1) have reported that in their opinion "the increase in citric acid content of the 350-cc. bottle of solution of magnesium citrate from the 33 Gm. of the U. S. P. IX to the 35 Gm. of the U. S. P. X was inadvisable and unnecessary."

---

* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] From the Laboratories of the Philadelphia College of Pharmacy and Science.

Obviously the best method of investigating this problem was the preparation of a series of samples in which all the variables likely to occur in pharmaceutical practice were introduced and their effects on the product tabulated.

Magnesium carbonate was obtained from two of the largest sources of supply in this country, and these samples assayed for their MgO and CaO content. Sample No. 1 gave results indicating an MgO content of 41.6 per cent and a CaO content of 0.31 per cent, whereas sample No. 2 contained 41.7 per cent MgO and a negligible amount of CaO. The latter was chosen for the experimental work, due to its lower calcium content.

Using a fresh supply of citric acid U. S. P. a series of experimental solutions of magnesium citrate were prepared in which the amount of magnesium carbonate employed was varied so as to give the equivalent of 15 Gm. of a 39.2% MgO carbonate, 15 Gm. of a 40% MgO carbonate, 15 Gm. of a 42% MgO carbonate and 15 Gm. of a 44% MgO carbonate per bottle. This was done in realization of the possible variation in commercial samples of magnesium carbonate. The other two variables introduced into the experimental work were the addition of potassium bicarbonate and sterilization. Thus sixteen experimental batches of solution of magnesium citrate were prepared, kept over a period of three weeks at room temperature and the presence or absence of precipitation observed at weekly intervals. The results of this study are as follows: (Slide I.)

	MgO Content of Carbonate Used.	$KHCO_3$ Used.	Sterile.	Condition on Aging. 1 Week.	2 Weeks.	3 Weeks.
1	39.2%	None	No	Clear	Mold	Mold
2	39.2%	None	Yes	Clear	Clear	Clear
3	39.2%	2.5 Gm.	Yes	Clear	Clear	Slight ppt.
4	39.2%	2.5 Gm.	No	Clear	Slight ppt.	Slight ppt.
5	40.0%	None	No	Mold	Mold	Mold
6	40.0%	None	Yes	Clear	Clear	Clear
7	40.0%	2.5 Gm.	Yes	Clear	Slight ppt.	Slight ppt.
8	40.0%	2.5 Gm.	No	Slight ppt.	Ppt.	Ppt.
9	42.0%	None	No	Clear	Slight ppt.	Slight ppt.
10	42.0%	None	Yes	Clear	Clear	Clear
11	42.0%	2.5 Gm.	Yes	Slight ppt.	Ppt.	Ppt.
12	42.0%	2.5 Gm.	No	Ppt. more than No. 11	Ppt.	Heavy ppt.
13	44.0%	None	No	Mold	Mold	Mold
14	44.0%	None	Yes	Clear	Clear	Clear
15	44.0%	2.5 Gm.	Yes	Ppt.	Ppt.	Heavy ppt.
16	44.0%	2.5 Gm.	No	Ppt. more than No. 15	Ppt.	Heavy ppt.

From the tabulation the following points seem important:

1. With 33 Gm. of citric acid per bottle a 39.2 per cent MgO carbonate or its equivalent must be used to give even fairly satisfactory results.

2. If the potassium bicarbonate is not included, the product is stable (if sterile) regardless of the carbonate used.

3. Using 33 Gm. of citric acid and 15 Gm. of the generally marketed magnesium carbonate, a very unsatisfactory product results if potassium bicarbonate is included according to the directions of the U. S. P.

4. Sterilization in some manner retards to a certain degree the precipitation observed in the product.

The precipitate which formed in the various samples was of the same character as that described by Rees (2) who found such a crystalline deposit to be tribasic

magnesium citrate. It was furthermore noted that those samples in which the magnesium oxide content was higher showed considerably more precipitation. This is in accordance with the findings of Oakley and Krantz (3) who showed that when citric acid in solution is treated with magnesium oxide tribasic magnesium citrate will be formed in solution before all the hydrogen ions arising from the primary and secondary dissociations of citric acid have been neutralized and that, consequently, an excess of citric acid would act in such a manner as to stabilize the solution against precipitation by virtue of its shifting the equilibrium in the direction of forming an acid citrate.

Realizing the importance of the free (titratable) acidity of solution of magnesium citrate the free acidities of the various experimental lots were determined, expressed in terms of cc. of $N/2$ NaOH required to neutralize 10 cc. of the solution in the presence of phenolphthalein indicator. It was found that the actual values obtained corresponded quite closely with those obtained theoretically by calculation, based on the magnesium oxide, potassium bicarbonate and citric acid content. This substantiated the results of Mayer (4) who found such a calculation to give a result very close to that obtained by actual titration.

As an illustration of this close conformity between actual and calculated free acidity values the following are given as examples:

	Actual Value.	Calculated Value.
Sample No. 2	10.13 cc.	10.10 cc.
Sample No. 4	8.76 cc.	8.66 cc.

In no case was the difference between the calculated and actual values greater than 0.3 cc.

Inasmuch as all the samples of solution of magnesium citrate containing potassium bicarbonate prepared in the laboratory showed evidence of precipitation, the authors were led to examine several of the commercial products on the market. Five samples were purchased from retail pharmacies in Philadelphia. Each sample was manufactured by a different large scale producer of this product, and was labeled with the official title.

All five samples were found to be perfectly clear without the slightest trace of precipitate being present. Each was then assayed for magnesium oxide, free acidity and total citric acid. The results were as follows: (Slide II.)

RESULTS OF ANALYSES OF COMMERCIAL SAMPLES OF SOLUTION OF MAGNESIUM CITRATE U. S. P. XI.

Sample No.	MgO Gm./100 Cc.	Free Acidity Cc. $N/2$ NaOH per 10-Cc. Solution.	Free Citric Acid (Calculated from Free Acidity Titration) Gm./350 Cc.	Total Citric Acid Gm./350 Cc.
1	1.676	10.92	13.38	33.46
2	1.680	8.89	10.89	31.15
3	1.633	9.18	11.26	30.91
4	1.461	9.58	11.74	29.28
5	1.652	10.92	13.38	33.64

From these figures it will be seen that all were of U. S. P. quality in regard to magnesium oxide with the exception of No. 4 which was 0.139 Gm./100 cc. lower than the U. S. P. XI minimum of 1.6 Gm./100 cc. Samples No. 2, No. 3 and No. 4 were below the U. S. P. XI minimum for total citric acid which may be shown by calculation to be 31.85 Gm. per 350 cc.

In regard to total citric acid deficiency it may be said here that, in the opinion of the authors, the requirement of the U. S. P. XI seems a little too rigid.

The statement at the end of the U. S. P. XI method for total citric acid "Not less than 26 cc. of half-normal hydrochloric acid is consumed," when converted into grams of citric acid per 350 cc. gives 31.85 Gm. This means that only a 3.48 per cent tolerance in citric acid content is allowed which is not in accordance with the tolerance set forth in other pharmacopœial solutions of a similar character.

Furthermore, the method prescribed for total citric acid as a rule yields somewhat low results due to the slight solubility of the calcium citrate precipitated in the process. As a maximum, however, this should not attain a degree resulting in more than 0.5 Gm. of citric acid per 350 cc. escaping detection.

In view of these two points the statement of the Pharmacopœia should, in all fairness, be modified to read "Not less than 25.2 cc. of half-normal hydrochloric acid is consumed." This would compensate for the maximum error of the method, 0.5 Gm./350 cc., plus a tolerance of 5 per cent, namely, 1.65 Gm./350 cc. giving 30.85 Gm./350 cc. This in terms of $N/2$ hydrochloric acid for 10 cc. equals 25.18 cc.

The perfect clarity of all the commercial samples was probably due to their high free acidities but upon close consideration it was seen that such values were impossible if the U. S. P. formula were followed. This was proved by taking the values obtained by assay for magnesium oxide, free citric acid and total citric acid and, assuming that the potassium or sodium bicarbonate was included, calculating the free acidity which the product should possess. The values so obtained were far below those actually indicated by titration. However, making similar calculations assuming the bicarbonate to have been omitted gave a series of figures very close to those actually obtained by titration. This is illustrated in the following tabulation: (Slide III.)

Comparison of Free Acidity Values.

Commercial Sample No.	Free Acidity Cc. $N/2$ NaOH 10 Cc. Soln.	Calculated Free Acidity from Determined MgO and Total Citric Acid Content if 2.5 Gm. $KHCO_3$ Were Added.	Calculated Free Acidity from Determined MgO and Total Citric Acid Content without Inclusion of $KHCO_3$.
1	10.92 cc.	9.25 cc.	10.68 cc.
2	8.89 cc.	7.32 cc.	8.75 cc.
3	9.18 cc.	7.60 cc.	9.03 cc.
4	9.58 cc.	7.98 cc.	9.41 cc.
5	10.92 cc.	9.63 cc.	11.06 cc.

Sample No. 5 will be seen to prove an exception, inasmuch as the calculated free acidity omitting the bicarbonate is slightly higher than the figure obtained by titration. This product, in all probability, had some bicarbonate, at least, put in the formula.

Mention has already been made of the somewhat low results given by the U. S. P. XI assay for total citric acid, due to the slight solubility of the calcium citrate precipitated in the process. It is quite unlikely, however, that this error exceeds over 0.5 Gm. citric acid per 350 cc. as a maximum. Assuming that this error were made it would only alter the calculated free acidities by 0.41 cc. The omission of bicarbonate on the other hand is reflected in a 1.43-cc. difference in the calculated free acidity.

These considerations leave little doubt but that the manufacturers whose products were examined are attaining the necessary free acidity to prevent pre-

cipitation by omitting a part, if not all, of the potassium or sodium bicarbonate. This is both illegal and detrimental to the therapeutic properties of the product. The potassium or sodium citrate formed by the added bicarbonate has therapeutic effect not possessed by magnesium citrate and its omission cannot be justified. The Pharmacopœia in permitting the use of CO_2 under pressure definitely states that this may be done in addition to the use of bicarbonate and not as an alternative process.

From our study it would appear that the present U. S. P. formula is unsatisfactory, inasmuch as, when made with many samples of U. S. P. magnesium carbonate on the market, the product is subject to precipitation. The pharmacist cannot be expected to assay his magnesium carbonate before using it, as would be necessary before a stable product could be made. The only means of preventing precipitation with the present formula is to withhold the bicarbonate until the solution is to be dispensed.

CONCLUSIONS.

1. Using 33 Gm. of citric acid per bottle a magnesium carbonate containing not more than 39.2 per cent oxide must be used to produce even a fairly stable solution of magnesium citrate.

2. Precipitation may be prevented using any official magnesium carbonate (39.2–41.5 per cent MgO) if the bicarbonate is withheld until the product is dispensed.

3. Sterilization in some manner retards precipitation observed in the product.

4. Many commercial samples give analytical results indicating that all or at least part of the bicarbonate is omitted from the product.

5. It is recommended that the U. S. P. permit a greater tolerance in the requirement for total citric acid.

REFERENCES.

(1) Arny, H. V., and Schaefer, H. H., Jour. A. Ph. A., 19, 941 (1930).
(2) Rees, E. W., *Am. J. Pharm.*, 102, 496 (1930).
(3) Oakley, M., and Krantz, J. C., Jour. A. Ph. A., 21, 132 (1932).
(4) Mayer, J. L., *Ibid.*, 16, 719 (1927).

DAPHNIA—THE BIOLOGICAL REAGENT.*

BY ARNO VIEHOEVER.[1]

Daphnia (*magna*), the transparent crustacean, possesses well-developed muscular, nervous and glandular systems (1, 2). It thus may serve as a remarkable test-animal for the detection of the presence or absence of substances, affecting the cells or organs of these systems. Such active agents may either be obtained from the plant, animal and mineral kingdom, or prepared synthetically.

---

* Presented before the Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing, A. Ph. A., Portland, Ore., meeting, 1935.

[1] From the Laboratory for Biological and Bio-Chemical Research, supported by Mr. William H. Gross, Philadelphia College of Pharmacy and Science.

As daphnia responds not only qualitatively but also quantitatively to medicinal products, added in therapeutic, toxic, critical and fatal doses, it permits the study of the physiological mechanism of drug action. It facilitates the recognition of the nature of a great variety of active substances and provides a basis for their evaluation.

From the multitude of stimulants, irritants and depressants, and chemicals of varied character, tested with this biological reagent, daphnia, the following are selected as representative. The grouping is based upon their outstanding physiological function.

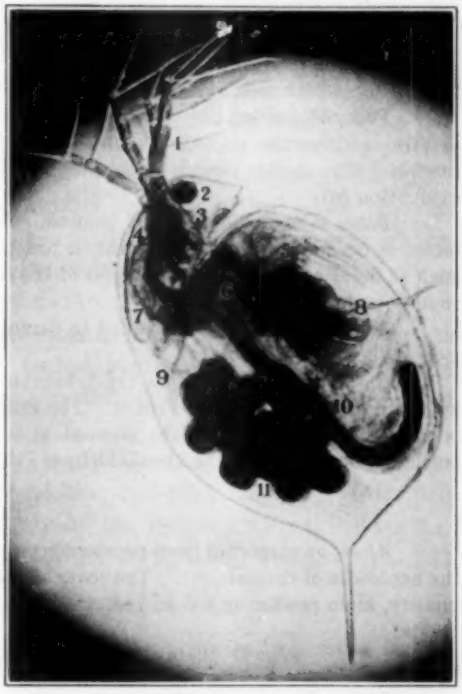


Fig. 1.—*Daphnia Magna:* 1—Swimming Arms. 2—Eye with Lenses. 3—Muscles with Optical Nerves. 4—Liver Glands. 5—Nephridial Bands. 6—Shell Gland. 7—Stomach (without Food). 8—Breathing Organs. 9—Heart with Valve. 10—Intestine with Food. 11—Brood Sac with Eggs.

I. Muscular System.

1. Locomotory Muscles.

Strychnine, used as the sulphate in various concentrations, causes in toxic doses a striking convulsion of the muscles of the swimming arms or antennæ. These convulsions resemble the tonic cramps so typical of strychnine poisoning of higher animals. Simultaneously the respiratory, and still more the circulatory systems, are greatly depressed (3). In this shift of body energy to the convulsing muscles of the swimming arms all other organs are made to suffer, even to the paralysis of the excretory system and final complete exhaustion (4). Death may, however, be prevented by the timely use of such physiological antidotes as ether and phenobarbital, mentioned later. Injection of strychnine into the blood stream of daphnia furnishes a very sensitive test for its presence, as amounts from as little as 1/50th to 1/100th of a milligram of strychnine sulphate caused the characteristic convulsions. Charts, lantern slides, photographic and photoelectrical records, as well as micro-movies, illustrate this effect.

Picrotoxin, too, produced the (clonic) cramps, the characteristic toxic effect known for vertebrate, or higher animals.

Excretory Organs.

Food Canal.—Of anthraquinone drugs, cascara has been studied, causing in a concentration of 1:15 (freed from alcohol) of the fluidextract progressive purgation and complete evacuation of the food canal within 19 minutes. Micro-movies illustrate this effect (5).

Aloe (*curacao*) and the resin (practically aloin-free) were found to be very active purgatives, causing complete evacuation in 0.05 per cent concentration in less than sixty minutes (6). The positive quantitative results obtained with many daphnia, standardized as to parentage, age,

sex and vitality may well represent a model for biological tests. The close agreement of the data is in contrast with the accepted view, expressed as late as 1933 by Clark (page 3) in his book on the action of drugs. "Physical and chemical tests are far more exact than are the biological tests; the information (provided by biological reactions) always tends to be vague and inexact."

The delayed action of aloin, considered three times more active than aloe, is of particular interest, as the finding agrees with that of early records of higher animal experiments, made even in the last century.

Rhubarb in low concentrations and its inferior substitute rhaponticum in like concentration, showed definite laxative effect (7).

Senna in the form of its fluidextract has been qualitatively tested with positive results of evacuating the food canal.

Phenolphthalein, in saturated aqueous solution, caused evacuation within thirty minutes.

Podophyllum studies, so far as they have progressed, permit the differentiation of toxic, laxative and inactive ingredients, all combined now in the crude drug and, more or less, in podophyllin. The studies promise a solution for the preparation of more suitable extracts and their evaluation (8).

Bitter salts as Glauber salt (sodium sulphate) and epsom salt (magnesium sulphate), the latter in concentration of 1 per cent or less caused speedy laxation; in higher concentrations, such as 3 per cent, it caused paralysis of the food canal and death through the dehydration of tissues.

Living organisms, yeast, added to daphnia in their normal culture medium, caused evacuation of the intestines (9).

Enzymes of the emulsin type, breaking down glucosidal substances as amygdalin, are evidently present in the food-canal. The enzymatic hydrolysis observed after ± sixteen hours, is speeded up according to the amount of emulsin added, causing the formation of the blood poison, hydrocyanic acid and benzaldehyde (10).

KIDNEY.

Aloin, as suspected from previous reports concerning its effect upon higher animals, affects the nephridia of daphnia (6). The toxic action becomes particularly marked in animals with low vitality, aloin producing a deep red vital stain upon retention and re-resorption in the nephridial bands.

RESPIRATORY ORGANS.

Insecticides, as rotenone, rotenone resin and cube extract containing rotenone, cause the paralysis of the breathing legs. If the rotenone is not oxidized in the upper food canal, then the digestive canal will also be paralyzed—a toxic action which has correspondingly been observed in higher animals, such as cats, rats and rabbits (11).

Ammonia in concentrations of 0.1 cc. (28 per cent) to 40 cc. culture water caused asphyxia and death to daphnia within fifty to sixty seconds, in higher concentrations much faster; in concentrations of 0.1 cc. (28 per cent) to 10 cc. culture water practically instantly. The symptoms corresponded to those characteristic for ammonia effect upon higher animals.

Benzaldehyde, when prevented from quick oxidation to benzoic acid, causes drowsiness, paralysis and asphyxia due, possibly, to its solvent action upon the cell lipoids. Similar results have been observed in rats and a dog (10).

CIRCULATORY ORGANS.

Digitalis and its constituents have been studied with interesting results.

Digitoxin.—Saturated aqueous solutions increased the tone of the heart muscle, the heart stopping in five to six hours. Digitoxin solutions lost their activity progressively on standing, even if kept in quartz containers to prevent alkali action of ordinary glass containers.

Digitonin.—A saturated solution of digitonin behaved in general like saponin solutions, a marked slowing of the heart was observed.

Digitalis (*Whole Leaf*).—Striking was the recovery of the heart of daphnia, depressed after chloroform administration, upon addition of a suspension of the leaf powder in culture water.

Gitalin and Bigitalin (*"Verodigen"*).—The recovery of the chloroformed heart from its depression was much more speedy when these digitalis glucosides were added. A record in the form of motion pictures shows that, in the absence of digitoxin, accumulation of digitalis in the heart muscle is reduced. The speedy recovery is undoubtedly due to the rapid absorption of these glucosides, much more soluble in water than digitoxin.

Caffeine.—Tested qualitatively, caffeine markedly increases the force of the heart beat, simultaneously slowing the rate. The heart stopped in diastole, when toxic doses were given.

II. Nervous System.

Anesthetics.—Ether, alcohol and especially chloroform were studied in detail. Chloroform causes in 3 per cent of saturated aqueous solution a characteristic depression of the heart beat, passing through the stages of coupled beat, spasms and progressively increased rest-periods to complete paralysis and death. This effect is recorded photographically, photoelectrically and with motion pictures. The toxic effect may be overcome with digitalis and its glucosides, as mentioned.

Hypnotics.—Chloral hydrate and especially phenobarbital and sodium phenobarbital have been found effective. Particularly satisfactory was phenobarbital in saturated aqueous solution in overcoming the convulsive action of strychnine (which was also affected with aqueous ether solution—1 per cent).

Alkaloids.—Strychnine has been studied qualitatively and quantitatively, as already mentioned; of others qualitatively tested, morphine and nicotine may be mentioned as affecting markedly the nervous system and organs depending upon its normal function.

Toxins.—Podophyllotoxin causes paralysis and death, rather than laxation; picrotoxin, as mentioned, causes strychnine-like convulsions; the toxin produced by hydra, causes, when injected directly by the hydra, or upon injection of the hydra extract, paralysis and death of the daphnia, after brief initial cramps.

III. Glandular System.

Qualitatively tested, adrenalin exerted a markedly stimulating effect on the heart of a dying daphnia; pituitrin on the reproductive system, speeding birth of young in the brood-sac; cantharidin upon the generative organ of the male, causing the periodic ejection of the sperm.

Liver.—The general function of this gland to retain poisonous substances entering the digestive system, in order to render them harmless, marks the glandular structures, obviously representing the liver in daphnia. Vital stains, excessively used, are found in the liver; strychnine may also be detected there after administration causing a decided shrinking of the glandular tissue, corresponding to the effect upon the liver in higher animals.

IV. Blood.

The blood poison, hydrocyanic acid, obtained in the process of enzymatic hydrolysis of cyano-genetic glucosides, as amygdalin, effects speedy death with the symptoms characteristic of hydrocyanic acid in higher animals, laxation, cramps, paralysis, coma, death (10).

V. Miscellaneous.

Adsorbents.—Colloidal magnesium and aluminum compounds—as "Kaomagma," for instance, permit the demonstration of their adsorbent qualities for

poisons—as strychnine. This will not cause in their presence the usual convulsions unless the quantity of strychnine is greatly increased.

Antiseptics, Disinfectants.—Phenol, qualitatively tested, caused convulsion-like reactions of the swimming legs, followed quickly either by paralysis, or recovery when speedily diluted with culture water—in agreement with the irritant and toxic effect upon higher organisms.

Pyridium, as a specific antigonorrheal, quickly penetrated through the digestive canal, staining the intestinal wall and sex organs of the male in a differential manner, thus serving also as a vital stain.

Vital Stains.—The use of vital stains such as neutral red, alizarin and many others, permits the differentiation of cells, organs and tissues, the more adequate study of their morphology and physiological functions, normal and abnormal (16). Eosin brings out the nerves in the muscle fibres leading from the brain to the retina of the eye. The staining of vital tissues with fluorescing substances is particularly sensitive when seen under reflected light in the dark field microscope.

VI. Metabolism.

The effect of low-freezing temperature and progressive hydration on lowered body function and lowered metabolism can be readily observed, the circulatory system being evidently last affected (17). The continued specific study of toxic substances such as heavy metals, interfering with normal enzyme and tissue action, is in progress; as is the study of physiological antidotes; of vitamines and other food substances, affecting normal nutrition, growth and development of cells and organs; of additional hormones, assuring their normal function.

Methodical.—The methods of propagation of daphnia for experimental, biological purposes, have been worked out, assuring a uniform and ample supply of test animals (18). The testing by direct medication through the culture water or through injection into the blood stream has also been accomplished.

SUMMARY.

Daphnia (*magna*) with its major structures, and functions clearly visible—either directly or after vital staining, with its marked physiological responses to medical and other agents, not unlike those of higher animals, is truly a remarkable biological reagent.

Its use opens a new world for experimentation. It provides a new tool for identification, differentiation and evaluation of physiologically active substances. It furnishes a unique opportunity to study the intricate mechanism and balanced rhythm of life.

REFERENCES AND RECORDS.

(1) Viehoever, A., "Transparent Life," *A. J. P.*, 103, 252–278 (1931).

(2) Viehoever, A., "Daphnia—Life Mechanism, *Micro Movies* (1932).

(3) Viehoever, A., Mikuriya, A. S., "Effect of Strychnine upon Daphnia," Jour. A. Ph. A., 21, 239–242 (1932).

(4) Viehoever, A., "Effect of Pheno-Barbital on Strychnined Daphnia," *Micro Movies* (1934).

(5) Viehoever, A., "Effect of Cascara on Daphnia," *Ibid.* (1934).

(6) Viehoever, A., "Evaluation of Aloe," *A. J. P.*, 107, 47–72 (1935).

(7) Viehoever, A., "Report on Rhubarb and Rhaponticum," *J. A. O. A. Chem.*, 16, 530 (1933).

(8) Viehoever, A., Mack, H., "Biochemistry of Podophyllum Peltatum," JOUR. A. PH. A., unpublished.

(9) Viehoever, A., "Yeast in Welfare and Industry," *A. J. P.*, 105, 114–144, (1933).

(10) Viehoever, A., Mack, H., "Biochemistry of Amydgalin," *Ibid.*, 107, No. 10, 1935.

(11) Viehoever, A., "Physiological Characteristics of Rotenone," *Ind. and Eng. Chem.*, unpublished.

(12) Viehoever, A., "The Heart," *A. J. P.*, 100, 718–745 (1928).

(13) Viehoever, A., Mikuriya, A. S., "Effect of Digititoxin on the Heart of Daphnia," JOUR. A. PH. A., 18, 1137 (1929), Abstract.

(14) Viehoever, A., Tubis, M., *Ibid.*

(15) Viehoever, A., "Effect of Digitalis and Its Glucosides upon the Chloroformed Heart," *Micro Movies* (1933).

(16) Viehoever, A., "Adding Color to Life," *Pennsylvania Acad. Sci.* (unpublished).

(17) Viehoever, A., "Water, Life Blood," *Popular Science Series*, 11, 178–202 (1934).

(18) Viehoever, A., "Daphnia Propagation for Experimental Use," *A. J. P.*, 107, 103–130 (1935).

ANTISEPTICS: A COMPARATIVE STUDY OF LABORATORY AND PRACTICAL TESTS.*

BY GEORGE F. REDDISH.[1]

Antiseptic substances were used for the preservation of food long before putrefaction and decay were shown to be caused by microörganisms. When Pasteur demonstrated the microbic origin of fermentation, he not only solved the problem of food spoilage but also took the first step in the scientific study of the cause of disease. The discovery of the cause of fermentation and disease led immediately to a study of the methods for preventing microbic activity pertaining to each. While Pasteur at first directed his efforts toward methods for controlling fermentation, a young English surgeon, Joseph Lister, made the first attempts to control the cause of infection.

Remembering the speculation of Robert Boyle two centuries earlier that the discovery of the cause of fermentation would lead to explanation of the cause of disease, Lister began his epochal studies on infection shortly after Pasteur announced results of his brilliant studies on fermentation. Without actually isolating the bacteria causing "hospital gangrene," Lister assumed that some kind of microorganism was the cause of these infections and in his effort to prevent post-operative "gangrene" he used a chemical which was known to be effective for preventing putrefaction. Carbolic acid in concentrations of 1–20 and 1–40 were employed for this purpose. After using this germicide for disinfecting surgical instruments, dressings, bandages and the operative field, infection following operations was greatly reduced. The use of this germicide in surgery formed the basis of Lister's system of antiseptic surgery.

From that day to this, antiseptics have been employed for two purposes (1) to preserve food by preventing the growth of bacteria causing putrefaction and decay, and (2) to kill or inhibit the bacteria which cause infections. This double meaning of the word "antiseptic" is still recognized. While the inhibitory meaning is emphasized in bacteriology textbooks, the germicidal meaning is most common among the medical profession and laity.

---

* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] Professor of Bacteriology, St. Louis College of Pharmacy.

Following the announcement of Lister's system of antiseptic surgery in 1867, efforts to discover the cause of diseases and infections generally were intensified with the result that the cause of suppuration—"hospital gangrene"—was soon discovered. *Staphylococcus aureus* and *albus* and the streptococci were early found to be the principal causes of wound infections. Carbolic acid in the dilutions employed by Lister were found by practical experience and later by laboratory test to be effective in killing these suppurative microörganisms.

In the early laboratory methods for testing the effectiveness of germicides, none of the suppurative bacteria were employed as test organisms. The anthrax bacillus, *B. coli* and *B. typhosus* were the principal ones employed in testing the value of germicides. When new germicides were developed during the succeeding years, their germicidal activity was measured by what is known as the phenol coefficient test, with *B. typhosus* as the test organism. This condition obtained for almost thirty years up until 1924.

While bacteriologist in charge of testing disinfectants in the U. S. Food and Drug Administration, I began, in 1924, the study of methods of testing antiseptics. Since *Staphylococcus aureus* is the most common cause of suppuration, as well as the most resistant of the non-sporing disease-producing bacteria, it was naturally selected as the principal test organism. After studying twenty-five freshly isolated strains of *Staphylococcus aureus*, a phenol standard of resistance was established and at the same time a method for testing the germicidal activity of soluble liquid antiseptics was described (1). A little later methods for testing the various kinds of antiseptic preparations, for germicidal as well as bacteriostatic activity, were published (2); these procedures were subsequently adopted as standard methods for testing antiseptics by the U. S. Food and Drug Administration (3).

In each of these methods for testing antiseptics a considerable margin of safety is established so that the public will be assured of the maximum protection. For example, excessive numbers of the most resistant of the non-sporing pathogens, *Staphylococcus aureus*, are used in the various tests. Although an average of but 40 bacteria are found per square centimeter on the human skin, and although only approximately 15,000,000 bacteria of all kinds are found per cubic centimeter of rinsings of the mouth surface, approximately 350,000,000 of the most resistant of all the disease-producing bacteria found on the skin and mucuos membranes are employed in the principal germicidal test. This is a far greater number than is found even in an equal quantity of pus. This is a severe test, but being so, it serves to weed out ineffective preparations which claim to be antiseptic.

Since 1925 the Food and Drug Administration has required liquid antiseptics which are recommended for short time application to kill approximately 350,000,000 *Staphylococcus aureus* by this standard test within five minutes (0.5 cc. of broth culture of *Staphylococcus aureus* in 5 cc. of antiseptic at 37° C.). Liquor Antisepticus N. F. IV,[1] which was employed in the present study, not only passes this test, but does so within a much shorter time than is required. Instead of requiring five

[1] Liquor Antisepticus N. F. IV was selected for this study because the N. F. V formula was changed in a way that so reduced the germicidal efficiency that it no longer passed the standard Food and Drug Administration test for liquid antiseptics. (This work was done before publication of National Formulary VI. Liquor antisepticus N. F. VI, however, possesses the same germicidal efficiency as Liquor Antisepticus N. F. IV).

minutes to kill *Staphylococcus aureus* by this test, this antiseptic has been shown to pass this severe test in from thirty to ninety seconds.

Experience has shown that germicides which pass this test—which kill approximately 350,000,000 *Staphylococcus aureus* within 5 minutes or less—also kill the other pyogenic organisms in even larger numbers. Some germicides, however, are specific in their activity toward certain classes of microörganisms, especially as between Gram positive and Gram negative bacteria, in which cases the test must be varied accordingly. A few germicides are highly bacteriostatic, necessitating additional transfers in broth in order to overcome this factor (4). Liquor antisepticus N. F. IV, however, is not selective in its activity and it is not bacteriostatic in even low dilution. It is even more effective against other disease germs than it is against *Staphylococcus aureus*. According to the standard Food and Drug Administration Method, therefore, Liquor Antisepticus N. F. IV is shown to be an effective antiseptic.

It is of interest to know just what such an antiseptic will do when used in practice. In other words, how effective will an antiseptic which passes the government

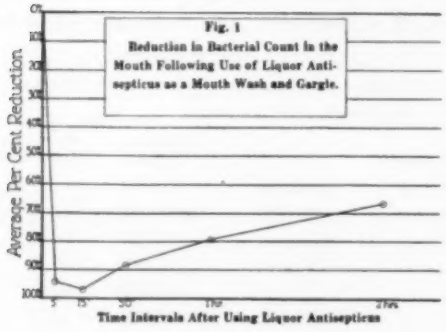


Fig. 1
Reduction in Bacterial Count in the Mouth Following Use of Liquor Antisepticus as a Mouth Wash and Gargle.
Average Per Cent. Reduction
Time Intervals After Using Liquor Antisepticus

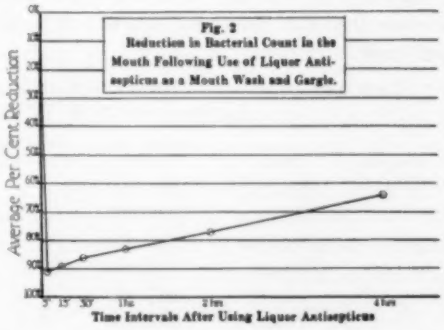


Fig. 2
Reduction in Bacterial Count in the Mouth Following Use of Liquor Antisepticus as a Mouth Wash and Gargle.
Average Per Cent. Reduction
Time Intervals After Using Liquor Antisepticus

standard test be in killing bacteria under practical conditions of use? Since the oral cavity harbors millions of bacteria and since suitable methods are available for determining the reduction of bacterial count in the mouth and throat, the efficiency of this antiseptic in killing bacteria in the oral cavity is selected for this comparison. Using a method which was developed in Johns Hopkins University (5), bacterial counts were made of the oral cavity before and after using this antiseptic and the reduction in numbers of bacteria computed.

This method, which is simple, gives results which are consistent and which are easily interpreted in terms of practical value. A slight modification of the Feirer and Leonard test (5) was employed in these studies. The mouth and throat are first rinsed thoroughly for 30 seconds with 20 cc. of sterile water. This rinsing is immediately plated in proper dilution in nutrient agar. After a two-hour wait for the bacterial count of the mouth and throat to return to normal, it is rinsed in a similar manner with 20 cc. of Liquor Antisepticus N. F. IV for 30 seconds. This is discarded, and the mouth and throat are then rinsed with 20 cc. of sterile water for 30 seconds at intervals of 5 minutes, 15 minutes, 30 minutes, 1 hour and 2 hours, after the use of Liquor antisepticus. These rinsings are immediately plated in proper dilutions in nutrient agar. All plates are incubated at 37° C. for 48 hours. On the following day a control test is made in which sterile water is used instead of Liquor Antisepticus N. F. IV, the rinsings being made at the same time periods, that is 5, 15 and 30 minutes, and 1 and 2 hours after the first control rinsing. At the end of 48 hours, the bacteria are counted and the percentage reduction is calculated.

It was found that following the use of Liquor Antisepticus, the numbers of bacteria in the mouth and throat were reduced as much as 98.7%, with an average of 96.7%. These reductions were observed fifteen minutes after the antiseptic has been used as a mouth wash and gargle. Reduction in bacterial numbers was not temporary, but lasted for two to four hours or more. The following average reductions in bacterial count were obtained after this antiseptic had been used as a mouth wash and throat gargle (thirty tests): 5 minutes, 94.6%; 15 minutes, 96.7%; 30 minutes, 87.0%; 1 hour, 79.5%; and 2 hours, 66.3% (see Table I and Fig. 1). In another series of 152 tests with Liquor Antisepticus N. F. IV, the reduction in bacterial count in the oral cavity four hours after such use showed an average reduction of 64% (see Fig. 2). The water control, on the other hand (the same quantity of water used as a mouth wash and throat gargle in place of the antiseptic), mechanically removed mouth bacteria to the extent of only 35% (see Fig. 3). It is obvious that the difference between 35% and 96.7% is due to the germicidal activity of the antiseptic.

Fig. 3

Comparison of Reductions in Bacterial Count in the Mouth Following Use of Liquor Antisepticus as a Mouth Wash and Gargle and Following Use of Water as a Mouth Wash and Gargle.

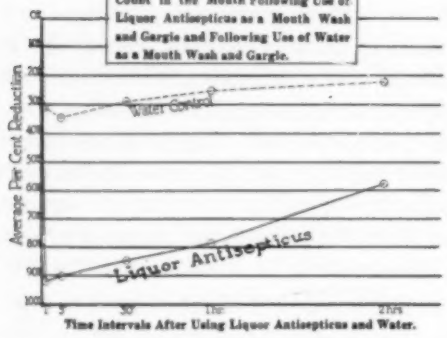

Average Per Cent Reduction
Water Control
Liquor Antisepticus
Time Intervals After Using Liquor Antisepticus and Water.

TABLE I.—BACTERIAL REDUCTION ON SURFACE OF MOUTH FOLLOWING USE OF LIQUOR ANTISEPTICUS N. F. IV AS A MOUTH WASH AND GARGLE.

Subject.	Test.	Bacterial Count.	Per Cent Reduction.	Subject.	Test.	Bacterial Count.	Per Cent Reduction.
"A"	Control	1,550,000		"F"	Control	14,654,000	
	5 min.	75,000	95.2%		5 min.	361,000	97.5%
	15 min.	32,000	97.9		15 min.	512,000	96.5
	30 min.	217,000	86.0		30 min.	1,223,000	91.7
	1 hour	321,000	79.3		1 hour	1,895,000	87.1
	2 hours	412,000	73.4		2 hours	3,554,000	75.7
"B"	Control	1,730,000		"G"	Control	2,520,000	
	5 min.	92,000	94.7%		5 min.	250,000	90.1%
	15 min.	46,000	97.3		15 min.	175,000	93.1
	30 min.	269,000	84.5		30 min.	825,000	67.3
	1 hour	488,000	71.8		1 hour	950,000	62.3
	2 hours	492,000	71.6		2 hours	1,725,000	31.5
"C"	Control	1,321,000		"H"	Control	1,980,000	
	5 min.	85,000	93.6%		5 min.	96,000	95.2%
	15 min.	29,000	97.8		15 min.	51,000	97.4
	30 min.	142,000	89.3		30 min.	195,000	90.2
	1 hour	398,000	69.8		1 hour	278,000	86.0
	2 hours	561,000	57.5		2 hours	495,000	75.0
"D"	Control	2,462,000		"I"	Control	7,620,000	
	5 min.	123,000	95.0%		5 min.	325,000	95.7%
	15 min.	62,000	97.5		15 min.	428,000	94.4
	30 min.	439,000	82.2		30 min.	659,000	91.4
	1 hour	517,000	79.0		1 hour	980,000	87.1
	2 hours	624,000	74.7		2 hours	2,760,000	63.8
"E"	Control	5,651,000		"J"	Control	3,680,000	
	5 min.	276,000	95.1%		5 min.	210,000	94.3%
	15 min.	73,000	98.7		15 min.	120,000	96.7
	30 min.	293,000	94.8		30 min.	256,000	93.0
	1 hour	915,000	83.8		1 hour	572,000	84.5
	2 hours	1,849,000	67.3		2 hours	1,020,000	72.3

Average Reduction in Bacterial Counts:

5 min.	15 min.	30 min.	1 hour	2 hours
94.6%	96.7%	87.0%	79.5%	66.3%

Five laboratories took part in these investigations and have proved conclusively that Liquor Antisepticus is effective in killing very large numbers of bacteria when used under practical conditions. It is true that all of the bacteria in the mouth and throat are not killed, but it has been proved that their numbers are reduced to a significant degree, and this is all that is expected of any antiseptic under conditions of practical use. No germicide will completely sterilize the skin, mucous membranes or infected tissue without doing serious damage to the tissue. By reducing the bacterial numbers to a significant degree, the desired purpose is accomplished. Liquor Antisepticus, which passes our standard germicidal test for liquid antiseptics, and meets government requirements as to germicidal efficiency as gaged by this test, is found by a large number of practical tests to be effective in killing significant numbers of bacteria when used under practical conditions of use.

Reduction of the bacterial count on skin and mucous membranes is of great importance because the number of disease-producing bacteria present on any body tissue has a direct relation to the possibility of infection. If large numbers of bacteria are present, the danger of infection is greater; if the numbers of bacteria are reduced, the danger of infection is lessened. Since this is true, it is to be expected that the clinical use of an effective antiseptic will in fact reduce the incidence of infection.

These extensive practical studies prove conclusively that antiseptics when used under practical conditions kill significant numbers of disease-producing bacteria and by so doing aid materially in preventing infection and in mitigating disease. These investigations also prove the adequacy of our present standard method of testing the germicidal efficiency of liquid antiseptics. Liquor Antisepticus N. F. IV passes the standard method for testing antiseptics used for short time contact and meets the requirements of the Food and Drug Administration for this class of drugs, and under practical conditions of use this antiseptic kills very large numbers of bacteria, reducing them to a significant degree.

SUMMARY.

Liquor Antisepticus N. F. IV passes the Food and Drug Administration test for soluble liquid antiseptics and it is shown to be effective in killing bacteria under practical conditions of use. Under the conditions of use in the oral cavity it reduces the bacterial count to a significant degree, an average reduction of 96.7% being demonstrated.

These findings give us added assurance that the standard Food and Drug Administration method of testing liquid antiseptics is satisfactory as a means of estimating the effectiveness of such antiseptics for practical use.

BIBLIOGRAPHY.

(1) Reddish, George F., "The Resistance to Phenol of *Staphylococcus aureus*," *Am. J. Pub. Health*, 15, 534–538 (1925).

(2) Reddish, George F., "Methods of Testing Antiseptics," *Journal of Laboratory and Clinical Medicine*, 14, 7, 649–658 (April 1929).

(3) Circular No. 198, United States Department of Agriculture, December 1931.

(4) Shippen, L. P., "A Fallacy in the Standard Methods of Examining Disinfectants," *Am. J. Pub. Health*, 18, 1231–1234 (1928).

(5) Feirer, W. A., and Leonard, V., "Antiseptics in Hygiene of the Teeth and Gums," *J. Am. Dental Association*, 14, 1049–1061 (June 1927).

The Kingsway Pharmacy, Toronto, Canada.

The Kingsway Pharmacy in Toronto features modern drug store ideas with the professional pharmacy, both of a high order. The pharmacy has been given the important place. A consulting room is adjacent to the dispensary and the Baby Room; in the latter are infant foods and related preparations. The consulting room provides the opportunity for physicians to speak with their patients. Ideas in the management of the professional side are incorporated from the suggestions of Professor Hogstad. The dispensary is in full view and of open construction; characteristic of the pharmacy in embossed letters of gold is the statement "In accordance with the fine art of the apothecary."

The building and interior are specially designed for this establishment. The sections devoted to other than professional service maintain dignity—there is a section devoted exclusively to toiletries, and while items carried in the modern store are displayed and sold extensively, these goods do not detract from the pharmacy, because of the arrangement. The soda fountain and cigars are important divisions and sources of income.

The opening of Kingsway Pharmacy was an event in Toronto on November 12th—it was estimated that more than five thousand people visited the store. The booklet given out was well designed and contained the story of pharmacy and described some of the features of the establishment and its various services.

The following are shown in the picture—the proprietors of the pharmacy—I. S. Wolfe and J. Senelnick, standing; seated are: Mr. Wolfe, a relative of the owners; Dean Charles F. Heebner, Dr. R. B. J. Stanbury, Secretary of Canadian Pharmaceutical Association; Prof. Anton Hogstad, Jr., chairman of the National Pharmacy Week Committee.

A STUDY OF GLYCERIN SUPPOSITORIES.*,[1]

BY WILLIAM A. PROUT.[2]

INTRODUCTION.

The combination of glycerin and soap, melted and molded into suppositories was reported by the Pharmaceutical Society of Great Britain as early as 1873 (1). It was not, however, until 1890 that a monograph for Suppositories of Glycerin found its place in the Seventh Revision of the United States Pharmacopœia. This preparation is still widely utilized as is demonstrated by its retention in four revisions of the pharmacopœia.

In comparing the formulas of Suppositories of Glycerin in the four revisions of the Pharmacopœia, some few slight changes have been made. When monohydrated sodium carbonate replaced the dekahydrated sodium carbonate in the United States Pharmacopœia VIII, a similar change was made in the Suppository formula.

The United States Pharmacopœia.	VII.	VIII.	IX.	X.
Glycerin	60	30.0	30.0	80
Sodium Carbonate	3	..	..	..
Sodium Carbonate Monohydrated	..	0.5	0.5	2
Water	..	5.0	5.0	10
To Make Suppositories No.	10	10.0	10.0	30

EXCESS OF ALKALI IN VARIOUS FORMULAS FOR GLYCERIN SUPPOSITORIES.

It is interesting to note the excess of alkali employed in the manufacture of Glycerin Suppositories throughout many parts of the world. Several formulas have been compared and summarized in the following table:

United States Pharmacopœia, Seventh Revision:			
Sodium Carbonate	Actual	3.0	
	Theoretical	2.5	(ten suppositories)
	Excess	0.5	
United States Pharmacopœia, Eighth and Ninth Revisions:			
Sodium Carbonate Monohydrated	Actual	0.50	
	Theoretical	0.43	(ten suppositories)
	Excess	0.07	
United States Pharmacopœia, Tenth Revision:			
Sodium Carbonate Monohydrated	Actual	0.65	
	Theoretical	0.58	(ten suppositories)
	Excess	0.07	
Japan, Third Edition, 1907:			
Sodium Carbonate	Actual	3.00	
	Theoretical	2.51	(ten suppositories)
	Excess	0.49	

* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.

[1] From the Laboratory of Operative Pharmacy, Philadelphia College of Pharmacy and Science.

[2] Remington Fellow in Pharmacy.

British Pharmacopœia Codex, 1932:

Sodium Carbonate	Actual	1.50	
	Theoretical	1.25	(ten suppositories)
	Excess	0.05	

Norway (1913):

Sodium Carbonate	Actual	5.0	
	Theoretical	4.53	(ten suppositories)
	Excess	0.47	

Scoville (2) did extensive work on glycerin suppositories and his formula was adopted and became official in the United States Pharmacopœia X. The main objection to the present formula is that it does not always produce a transparent preparation.

There has been recommended a change in the present formula for Suppositories of Glycerin to be made in the forthcoming revision of the Pharmacopœia. The following formula was proposed:

Glycerin	91.00 Gm.
Sodium Hydroxide, 50 per cent	2.52 Gm.
Stearic Acid	9.00 Gm.
Monohydrated Sodium Carbonate	0.09 Gm.
Water	0.5 cc.

To make about 30 suppositories.

Place the glycerin in a suitable vessel and heat on a water-bath, keeping the vessel well immersed in the boiling water, until the temperature is about 85° C. Add the sodium hydroxide 50 per cent or its equivalent of an approximately 50 per cent solution to the hot glycerin with thorough mixing. Melt the stearic acid in a small vessel and pour at once into the hot alkaline glycerin mixture, stirring thoroughly. Maintain the temperature at from 85° C. to 90° C. for twenty to thirty minutes. Dissolve the monohydrated sodium carbonate in 0.5 cc. of distilled water, contained in a test-tube and add to the hot mixture just finished. Mix thoroughly, pour the melted mass into suitable molds. Remove the suppositories when they are completely cold and preserve in tightly stoppered glass vessels in a cool place.

One of the most important prerequisites of a United States Pharmacopœial formula is that wherever possible, it may be prepared easily by both the pharmacist and the manufacturer. When the above formula is critically examined, it will readily be seen that from the standpoint of small scale production, it presents serious difficulties. It is a well-known fact that the strength of sodium hydroxide cannot be relied upon. Consequently a titration must be carried out to determine its strength before it may be used. Obviously in using a strong alkali the slightest excess would greatly increase the alkalinity of the product. On the other hand, if an insufficient amount was used, the suppositories would be opaque.

The object of this study was to develop the most simple and efficient formula possible for the preparation of glycerin suppositories. Inasmuch as sodium stearate may now be obtained of a high degree of purity, it was thought that the most logical procedure would be to formulate the suppositories by the direct incorporation of sodium stearate with glycerin rather than attempt the chemical reaction in the mass. Such a method would eliminate all the inherent errors that must be guarded against wherever a chemical reaction is involved.

With this idea in mind, a series of experiments was conducted, *first*, to deter-

mine the feasibility of such a method, and *second*, a ratio of ingredients resulting in the most desirable product from the standpoint of clarity and consistency.

EXPERIMENTAL PART.

All the materials used in this study were carefully checked for their purity and strength. The sodium stearate (Merck) was found to contain no free alkali.

DETERMINATION OF CONTENT OF WATER.

The per cent of water present in the finished product was determined by the use of the Toluene Distillation Method. This method has been adopted for inclusion in the Eleventh Revision of the United States Pharmacopœia. Ten grams of the suppository mass was placed in a flask and sufficient toluene added to cover the mass completely. The receiving tube was filled by pouring the toluene through the top of the condenser. The toluene in the flask was heated until it boiled and distilled slowly, about two drops per second, until most of the water had passed over; then the rate of distillation was increased to about four drops per second. When all the water was apparently over, the condenser was washed down by pouring toluene in at the top and the distillation continued for a short time to ascertain whether or not any water remained in the flask. The receiving tube was allowed to stand at room temperature and the volume of water read and calculated to determine the percentage.

DETERMINATION OF CONSISTENCY OF THE SUPPOSITORY MASS.

The consistency of each suppository mass was determined by means of the Asphalt Penetrometer. The degree of penetration in the different masses was measured; time, temperature, pressure and volume of mass were held constant. The time chosen for the penetration was five seconds. A mass of twenty grams in weight was poured into a standardized cup of 3.5-mm. depth and 4.1-mm. diameter and allowed to solidify at room temperature.

DETERMINATION OF p_H.

The determination of p_H of each suppository mass was made colorimetrically. A definite quantity (two rectal suppositories) was melted in a standardized test-tube, the indicator added and then the mass allowed to cool. Comparison was then made in the usual manner with the proper color standards.

The following experiments were carried out to decide the optimum ratio of ingredients necessary to provide the most desirable product and furthermore to determine if an added amount of excess alkali was necessary to bring about the proper degree of clarity.

Exp. No.	Gm. Glycerin.	Gm. Sodium Stearate.	Gm. Sod. Carb. Monohyd.	p_H.	Per Cent Water.	*Consistency.	[1] Appearance.
A-1	90	10	0.1	9.8	2.1	9	O
A-2	90	10	..	9.8	2.0	12	O
B-1	91	9	0.1	9.8	2.2	12	O
B-2	91	9	..	9.8	2.0	14	O
C-1	92	8	0.1	9.8	2.4	18	T
C-2	92	8	..	9.8	2.4	18	T
D-1	93	7	0.1	9.8	2.6	25	FT
D-2	93	7	..	9.8	2.8	28	FT
E-1	94	6	0.1	9.8	3.0	35	VT
E-2	94	6	..	9.8	3.2	32	VT
F-1	95	5	0.1	9.8	3.4	40	VT
F-2	95	5	..	9.8	3.6	38	VT

* Relative figures obtained with the Asphalt Penetrometer.

[1] VT—Very Transparent. FT—Fairly Transparent. T—Transparent. O—Opaque. VO—Very Opaque.

On the basis of the above results: Group C was chosen as the ratio providing the best consistency. When smaller amounts of sodium stearate were used, the suppositories became somewhat clearer but in consistency, they were not sufficiently firm.

There was not enough difference in the clarity C-1 with added monohydrated sodium carbonate and C-2 to warrant its inclusion in the formula.

The probable explanation of the similarity in p_H of both formulas with and without added alkali lies in the absence of sufficient water to enable the hydrolysis of the carbonate to take place.

The following experiments were undertaken to determine the effect of increased amounts of distilled water upon the clarity of Glycerin Suppositories made with glycerin and sodium stearate.

To 100 Gm. of a melted mass consisting of 95 Gm. of glycerin and 5 Gm. of sodium stearate, the following amounts of distilled water were added and the results tabulated:

Expt. No.	Cc. Water Added per 100 Gm. Mass.	p_H.	Per Cent Water.	*Appearance.
A	1 cc.	9.5	5.2	FT
B	2 cc.	9.8	5.8	FT
C	3 cc.	9.8	6.0	FT
D	4 cc.	10.0	6.2	FT
E	5 cc.	10.0	6.5	T
F	6 cc.	10.2	6.6	T
G	7 cc.	10.2	6.8	O
H	8 cc.	10.2	6.9	O
I	9 cc.	10.5	7.0	VO
J	10 cc.	10.6	7.2	VO

* Symbols previously explained.

DETERMINATION OF THE HYGROSCOPICITY OF GLYCERIN SUPPOSITORIES.

A series of experiments was carried out with different Glycerin Suppositories in order to determine the hygroscopic properties over a period of time.

The suppositories were weighed and placed in a desiccator containing water to furnish a high relative humidity. At stated periods, the suppositories were removed, weighed and the increase in moisture content noted. Fairly consistent results were obtained as will be noted as follows:

U. S. P. X.		B. P. C., 1932.		Developed Formula.	
Glycerin	80.0	Glycerin	90.0	Glycerin	92
Sod. Carb. Monohyd.	2.0	Sod. Carb.	4.5	Sod. Stear.	8
Stearic Acid	8.0	Stearic Acid	7.5	Water	5
Water	10.0				

Time.	Gain in Weight.	Gain in Weight.	Gain in Weight.
2 hours	0.1201	0.1244	0.1216
4 hours	0.2101	0.1618	0.1764
6 hours	0.2491	0.2150	0.2243
10 hours	0.3751	0.3462	0.4032
24 hours	0.7739	0.4282	0.9883
30 hours	0.9027	0.8842	1.4652
48 hours	1.3345	1.2748	2.1574
1 week	3.2327	3.0092	3.2849

There was approximately an increase of 192 per cent moisture over the entire period of one week.

THE EFFECT OF PROLONGED HEATING OF THE SUPPOSITORY MASS.

The experiments were undertaken to determine the effect of prolonged heating of a suppository mass in a covered vessel (double-boiler). Ten-minute periods of heating at 95° C. elapsed between pouring of the mass, with the exception of the last period which was of an hour duration. The following formula was chosen for these experiments:

Glycerin	92
Sodium Stearate	8
Water	5

Ten-Minute Periods of Heating at 95° C.	Per Cent of Water at End of Each Pouring.
First	6.8 per cent
Second	6.4 per cent
Third	6.2 per cent
Fourth	6.0 per cent
Fifth	5.8 per cent
Sixth	5.6 per cent
Seventh	5.4 per cent
Eighth	5.2 per cent
Ninth (one hour of heating)	4.8 per cent

As was expected, the per cent of water gradually decreased until along about the sixth pouring, when the percentage remained fairly constant.

From the standpoint of clarity, consistency and ease of manufacture, the following formula was chosen as the most desirable to produce an ideal suppository for both adult and infant types:

Glycerin	92
Sodium Stearate	8
Distilled Water	5

To make about 30 rectal suppositories.

Heat the glycerin to 95° C. in a double boiler. Add the sodium stearate, stirring very gently occasionally until a clear solution is effected. Then add the distilled water, mix thoroughly and pour the mass into suitable molds. Remove the suppositories when they are completely cold and preserve them in tightly stoppered glass bottles in a cool place.

CONCLUSIONS.

1. A study has been made of various formulas which have been proposed for glycerin suppositories.
2. The difficulties encountered with certain formulas have been enumerated.
3. A new formula in which sodium stearate is directly incorporated with glycerin is submitted as a practical method for their preparation.
4. A comparison of the various characteristics of suppositories made by this method with those made by other methods is presented.

REFERENCES.

(1) *Am. J. Pharm.*, 45, 189 (1873).
(2) Scoville, Wilbur, JOUR. A. PH. A., 13, 818 (1924).

THE DETERMINATION OF PHENOLPHTHALEIN IN MINERAL OIL EMULSIONS.*

BY C. F. BICKFORD AND R. E. SCHOETZOW.[1]

An accurate and practical method for the determination of moderately large quantities of phenolphthalein in mineral oil and agar emulsions involves two steps:

1. Separation of the phenolphthalein from the oil and the agar.
2. Determination of the phenolphthalein.

The separation of the agar is very simply carried out by treating the whole emulsion with a mixture of alcohol and ether. When the proportions of alcohol and ether are suitably chosen, this mixed solvent precipitates the agar and dissolves the oil and water. The most satisfactory mixture is 25 cc. absolute alcohol and 75 cc. ether; increasing the proportion of alcohol makes the subsequent isolation of the phenolphthalein more difficult. The precipitated agar is easily separated by filtration, but it carries down small quantities of phenolphthalein. These are recovered by dissolving the agar in a small amount of water and again precipitating with a fresh portion of the solvent mixture. After this reprecipitation the agar is tested for retained phenolphthalein by dissolving in water and adding a drop of dilute alkali; if no phenolphthalein is found it is discarded.

The solvent mixture containing the phenolphthalein is extracted with dilute alkali; the phenolphthalein passes into the aqueous layer to give the familiar colored solution. It is at this point that the proportion of alcohol and ether shows its effect; raising the alcohol above 25% renders the complete extraction of the phenolphthalein more difficult. The phenolphthalein is precipitated from the combined alkaline extracts by adding dilute sulphuric acid. This precipitate is not, in its present form, suitable for weighing. The mixture is extracted with ether and the resulting ether solution is extracted with alkali. Upon acidification this alkaline solution yields the phenolphthalein in a form which becomes coarsely crystalline after standing over night. The large crystals permit rapid collection on the Gooch filter.

The solubility of phenolphthalein in water is not negligible; 100 cc. of water at 21° C. dissolves about 3 mg. To the weight obtained must therefore be added a correction for the amount which remains in solution. The correction is determined for every assay by a colorimetric method. An exact description of the procedure follows:

A sufficient quantity of the emulsion to yield about 0.05–0.10 Gm. phenolphthalein is accurately weighed into a glass-stoppered Erlenmeyer flask. Seventy-five cubic centimeters of ether and 25 cc. absolute alcohol are added. The flask and contents are vigorously shaken and then allowed to stand for thirty minutes. The mixture is filtered into a separatory funnel and the precipitate washed with several small quantities of the solvent mixture. The agar is redissolved in about 5 cc. of water in the original Erlenmeyer flask and precipitated with fresh solvent mixture as previously described. The filtrate and washings from the reprecipitated agar are combined with the first filtrate in the separatory funnel. The agar is dissolved in water and tested for phenolphthalein by adding a drop of dilute sodium hydroxide, discarding if no phenolphthalein is present.

---

* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.

[1] Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

The solvent mixture is repeatedly extracted with 10-cc. portions of 0.04 normal sodium hydroxide until absence of color shows complete removal of phenolphthalein. The solvent mixture is then discarded. The phenolphthalein is precipitated from the combined alkaline extracts by slow addition of 0.1 normal sulphuric acid in slight excess. The precipitated phenolphthalein is completely extracted from this mixture with ether. The ether solution is again extracted with 0.04 normal sodium hydroxide, discarding the ether after complete removal of the phenolphthalein. The alkaline solution is acidified with 0.1 normal sulphuric acid, being careful to use only one or two cc. excess acid. The resulting precipitate is allowed to stand over night to permit coarse crystals to form. The crystals are collected on a tared sintered glass Gooch crucible, washed with four (5 cc.) portions of cold water, dried at 100° C. and weighed. The filtrate and washings are transferred to a 250-cc. volumetric flask. The beaker which contained the crystals is washed with 0.04 normal sodium hydroxide until colorless washings are obtained. These beaker washings are added to the 250-cc. flask containing filtrate and the solution is made up to 250 cc.

A standard phenolphthalein solution is prepared by dissolving exactly 0.03 Gm. of pure phenolphthalein in 250 cc. of 0.04 normal sodium hydroxide solution. The quantity of phenolphthalein in the filtrate and washings is now determined by matching the color of that solution against suitable dilutions of the standard solution. This quantity is added to the weight previously found.

Determinations by the described method are consistent and agree with theory. An analysis in duplicate of an emulsion prepared to contain 0.321% phenolphthalein indicated an averaged phenolphthalein content of 0.311%, the individual values being 0.319% and 0.302%. Similarly, another emulsion, the phenolphthalein content of which was less exactly known, contained an averaged phenolphthalein content of 0.289%, the individual values being 0.280% and 0.297%.

Occasionally emulsions of this type show some separation after aging. The nearly clear aqueous layer at the bottom of such a separated emulsion contained less than 0.01% phenolphthalein. The following table gives the amounts of phenolphthalein found in the top and middle portions for three samples of mineral oil and agar emulsions contained in bottles.

Sample.	Per Cent Phenolphthalein. Top Portion.	Middle Portion.
B	0.335	0.310
	0.333	0.332
E	0.315	0.320
F	0.377	0.373

These data show that, although the bottom aqueous layer of an emulsion which has undergone separation is low in phenolphthalein content, the remainder is quite uniform in respect to the quantity of phenolphthalein present. The whole sample will again have a uniform distribution of phenolphthalein after shaking to re-incorporate the separated water.

THE CLINIC PHARMACY.*

BY JOSEPHINE NICHOLS.

We speak of a Clinic as an organized group of doctors working together for the welfare of the patient. With such a group a pharmacist has a very definite place. It is here that pharmacy can be practiced in its most professional aspects and should therefore appeal to the pharmacist who is interested in the science itself and who need not be hampered by the economics of business management and

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Dallas meeting, 1936.

salesmanship. In these days of more group practice among doctors, the time should be opportune for establishing more of these pharmacies.

No two professions are more closely associated than medicine and pharmacy, and both doctors and pharmacists realize that close coöperation between the two professions is most essential as well as advantageous. The professional pharmacist must depend entirely upon the doctors for his work, and in turn the doctor is assured by experience that his prescriptions are being filled accurately by some one who is as much concerned in helping the patient as in making money.

We should make ourselves essential to the doctors, too. This can be done in a variety of ways. In a Clinic one has access to all the current medical journals and the latest information of all kinds in the practice of medicine. It is well to avail oneself of this opportunity to keep informed on the ever-changing trends in medication and learn the medical point of view on old and new drugs. This is not for the purpose of making suggestions to the doctors unless they ask for them, but you will find they will appreciate your ability and willingness to help them with some medications when they ask for your coöperation. One is surprised and interested to read of the amount of research being done with many of the U. S. P. drugs and it is easy to understand why doctors change so much in their treatment of many of the common diseases. For example, during the past year there has been a great deal of literature on Iron Therapy in a simple anemia. All the regular iron preparations and many of the fancy proprietaries have been used only to find that Reduced Iron in large doses is most efficient. In our own Clinic we were using the large doses long before most others were using any but two- and three-grain doses. A few years ago we would have been astounded if a doctor ordered seventeen Blaud's Pills to be taken each day but we learn that is the amount necessary for a person to utilize what iron he can from them. It is worth one's effort to keep informed on biologicals in the same manner.

There are still many doctors who prefer writing prescriptions for their own combinations of drugs rather than always write for some ready mixed and easily dispensed preparation. When they know they can be assured the accuracy and time necessary for doing this, they will take advantage of it. In compounding prescriptions for the same group of doctors the pharmacist will be acquainted with their favorite combinations and can keep many preparations such as nose and eye drops, capsules, ointments, etc., made up. As you know, many of these preparations require much time to make because of chemical reactions and long compounding procedures, and having them on hand saves time for both the doctors and patients. The pharmacist is also thoroughly acquainted with the doctors' idiosyncrasies in prescription writing and consequently mistakes can be avoided.

A small Clinic Pharmacy has many business advantages. The space occupied is small and equipment can be arranged compactly. No space is needed for display or advertising material. We have a new glass front dispensing room through which the patients, if they choose, may follow every step in the procedure of filling their prescriptions. Many people are impressed to see how accurately and painstakingly this is done. One need not be interrupted by having to sell a five-cent cigar or any other item, and that in itself should lead to better work.

Buying, as in any business, is very important if the business is to be successful. When one works so closely with the doctors there need be no dead stock and this

can be done without having to ask the doctors to use certain preparations because you have a lot on hand. One knows about how much of the standard preparations they are using, and can be very conservative with the new ones until he sees how they are being prescribed. Often one feels he has to buy according to what the detail-men say the doctors are going to use. In knowing the doctors, the pharmacist will be able to tell whether they took the line of least resistance and said, "Sure, I'll prescribe it," or whether they really will use it. Most of the stock in a Clinic Pharmacy can be quick turnover items so that it need not be large at any time. By making use of his time, one can save a great deal by making up many preparations. There are many things, of course, that it does not pay to do this with, but it is surprising how much can be accomplished when there are no "small sale" interruptions.

I believe the refill business in the Clinic Pharmacy is better than in a regular drug store. Frequently a patient comes in to ask if the doctor wants him to continue with his medicine. The prescription can be looked up by the use of a card index and the doctor informed what it is. Very often we have the opportunity of refilling it. It is well to have the patients realize the importance of identifying their prescriptions by prescription number rather than "that red liquid I got last month," or "those brown tablets for the baby." This teaches them that medicines are prescribed for each individual in treatment for one certain condition and are not to be passed on to friends and relatives who seem to have similar complaints.

In our Clinic, nothing is sold over the counter except bandages, adhesive tape and boric acid. Every tablet and liquid bears a prescription label. This, we feel, is as beneficial to the patient as to the profession. There are many preparations that have become counter items which should have remained strictly prescription drugs. In illustration, a great deal of harm has come from people becoming familiar with the names of the phenobarbital derivatives and being able to buy them without restriction. Doctors see the great harm in this but often find it easier to tell the patient to go and get a certain medicine than to write a prescription. In most cases doctors do not realize the extent the lay people abuse and misuse this information. With a little coöperation from the Pharmacist, they will be glad to do their part. After all, we must keep in mind the welfare of the patient and not just how much we can sell.

The Winona Clinic consists of six doctors, two of whom do little else than surgery; one is an eye, ear, nose and throat specialist, and three are general practitioners. In spite of the fact that these doctors are very conservative in their prescription writing, one pharmacist is kept constantly busy.

The Pharmacy is owned by the Clinic and was opened January 1, 1925. There was a consistent increase in business until 1932 after which it remained constant until a recent change of location when it has increased. More than 56,000 new prescriptions have been filled averaging 4980 annually which has led to a good income. Business is done on a cash basis.

The Pharmacy consists of two adjacent rooms $8' \times 11\frac{1}{2}'$ and $6\frac{1}{4}' \times 11\frac{1}{2}'$. We have a chute from the upstairs, where the doctors' offices are, into which the doctors may drop their prescriptions as they are written so they will be ready for the patient when he leaves the Clinic. Patients are free to have their prescriptions filled at any Pharmacy they choose, but we find that the Clinic Pharmacy fills

90% of all those written by our doctors. Nine months ago the Clinic was remodeled and the Pharmacy was moved from the back of the second floor to the first floor, directly across from the elevator. Since this change, the Pharmacy income has increased an average of $100.00 a month over that of the corresponding month of the previous year.

In closing, I wish to say that in my opinion no "set up" could give more professional satisfaction to the pharmacist than a Clinic Pharmacy. Daily contact with the same group of doctors and attendance at their monthly staff meetings has made me feel that I am a most essential part of their organization. With this self-satisfaction and the knowledge that the Pharmacy has been most successful financially and professionally, I can most heartily urge any pharmacist to become a part of a similar group.

THE PRINCIPLES FOR CORRECT PRESCRIPTION PRICING.*

BY GEORGE LOUIS SECORD.

Since the Prescription Department is the yardstick by which drug stores should be measured, it follows that prescription pricing is obviously of paramount importance. A seeming lack of understanding by great numbers of pharmacists of the principles underlying the operation of the Prescription Department and the great variation of the estimated cost of operation, even in the same districts, has offered to me the necessary stimuli to undertake a general investigation of the subject in an attempt to arrive at a rational basis on which to price medicine to the patient.

Two facts seem to stand out prominently in making a preliminary survey which in themselves would justify any effort made in this direction:

1. Insufficient remuneration from the Prescription Department resulting in discouragement to the pharmacist and thereby promoting more and more the merchandising phase of his business.

2. Lack of uniformity in pricing and the absence of a definite and reasonable basis for establishing the charge. This angle of our business is responsible for the skepticism of the physician and the frequent criticism he pours forth due to the lack of solidarity within our own ranks and the obvious lack of understanding on his part. Who could blame him when such great discrepancies such as we have all seen are brought home to him by his patients. This is one of the vital factors which has stimulated dispensing by many physicians. Naturally the physician wants his patients treated fairly and when one is charged more for the same item than another has paid, he immediately forms the opinion that the one paying the higher price has been charged too much. It has been my experience that usually the one paying the lower price has been charged too little. Patients with the same experience as cited for the physician, develop mistrust, start the shopping practice and finally resort to the unsavory and dangerous practice of self-medication. Need I remind you, that in many cases of this nature, the patient receives a large measure of co-

* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.

operation from the physician with resulting harm to himself and the profession as a whole.

We are living in a too highly developed age to permit our names or institutions to be made a part of "hit or miss" methods of bygone days. The security of our business demands scientific handling in other departments, why not the Prescription Department? Many methods have been suggested in the past but in nearly every case they have been predicated on "average" costs of prescriptions taken from hundreds of stores or built up on some other equally unreliable basis rather than on a definite scientific basis.

In justice to our profession, it should be our responsibility to embrace those principles in our suggestions which will stabilize our profession from a professional as well as an economic angle.

Our first element of consideration must be the Prescription Department covering:

1. Investment: (*a*) Stock. (*b*) Fixtures. (*c*) Equipment.
2. Expense of Operation: (*a*) Advertising. (*b*) Telephone. (*c*) Deliveries. (*d*) Depreciation of Stock, Fixtures and Equipment. (*e*) Repairs, Paper and Miscellaneous. (*f*) Physician's Blanks. (*g*) Sampling. (*h*) Loss on Accounts. (*i*) Window Dressing. (*j*) Sign Work. (*k*) Cleaning.
3. Help for Prescription Department.
4. Based on floor space occupied, apportionment of: (*a*) Rent. (*b*) Light. (*c*) Insurance-Taxes. (*d*) Decorating.

A prescription department doing 40 prescriptions daily could operate this department with 15 hours of work by registered pharmacists and 15 hours of work by registered apprentices. At this junction we must not overlook the great waste of time which takes place in the prescription department and about which we can do nothing. This thought embraces the amount of time given to the discussion of prescriptions with customers; the telephone call-backs for proper directions not given on the label; the demands made by the customer to locate a prescription that was filled on such and such a day, and seldom proves to be the case; telephone refills; the time given up to consultations with the medical profession and numberless other interruptions which make up easily one-third of the total hours ($^1/_3$ of 15 hours) in the day. It is obvious, then, that only ten of the fifteen hours are actually devoted to the work of compounding prescriptions. Therefore, in order to properly assimilate the overhead, it is necessary to base the day on 10 hours instead of 15.

I am sure we realize too well, that salaries of pharmacists during the past five years have been far too low for us to expect that these highly trained men would remain in the profession, or that we, as pharmacists, should command professional respect as a consequence of the economic letdown.

With the possible exception of rent in certain areas, the other expenses of operation, excluding salaries, remain about the same as in normal times. The author is of the opinion that the week-work period for pharmacists should be 50 hours and that the minimum schedule of compensation should be: (*a*) Pharmacists $1.00 per hour. (*b*) Assistant Pharmacists or equivalent $.70 per hour. (*c*) Apprentices, over one year experience, $.30 per hour and up.

The following schedule of expenses, after considerable study, has been accepted as fair and appropriate:

40 AVERAGE PRESCRIPTIONS DAILY.

		Daily.
1.	Registered Pharmacists 15 hours @ $1.00 per hour	$15.00
2.	Registered Apprentices 15 hours @ .30 per hour	4.50
3.	Delivery expense: car-fare, etc.	1.00
4.	Taxes and Insurance pro-rated	.55
5.	Depreciation stock and fixtures pro-rated $1.50; interest on investment $1.00	2.50
6.	Repairs—paper—breakage—miscellaneous	.70
7.	Physicans, Dentists and Store Blanks	.25
8.	Advertising: Medical Bulletins, Letters—Donations pro-rated, Sampling	1.50
9.	Telephone	.75
10.	Store Expense pro-rated: Rent, Light, Cleaning, Window Trimming, Window Cards, Miscellaneous Help.	6.00
	Total Expense	$32.75
	Profit on sales of proprietaries, drugs, etc., made in Prescription Department	2.75
	Daily overhead charged to prescription operation.	$30.00

The average profit return on the sale of proprietary medicines, drugs, oils, etc., is $2.75. This deducted from the total prescription expense, leaves $30.00 assignable strictly to prescription compounding.

Based on ten actual hours of work, it is obvious that the cost *per hour* of operating a prescription department compounding 40 prescriptions daily, is $3.00. It follows, therefore, that each prescription compounded must bear its proportionate share of the operating costs depending upon the amount of time required in each case. If 40 prescriptions are compounded in the working day and ten hours represents the time consumed, then, if each prescription required the same amount of time, 15 minutes would be necessary for each.

It would seem hardly necessary to mention that the foregoing merely takes care of the *time element* in the prescription department. As a matter of fact, we know too well that in the case of many prescriptions it is difficult to obtain even the full retail price, to say nothing of the added cost of handling the item in the Prescription Department. Every department of business should show a profit. With simple ready-made preparations we have one problem; with the compounded type of prescription, another. I have pondered the question of pricing these two general types, and have at times even considered the advisability of disregarding the ready-made type of trade-marked prescription from the timing angle, and leaving only the ethical ready-made type of product and the compounded type of prescription. Obviously, under this plan the cost per hour would be increased, in some instances, to a disproportionate degree. To cover loss occasioned by the filling of this type of prescription, and to attempt to procure a profit on the operation of this Department, the following methods are suggested:

A careful survey has revealed that most prescriptions can be conveniently divided into four classes, namely:

1. Inexpensive Compounded Prescriptions.
2. Expensive Compounded Prescriptions.
3. Inexpensive Ready-Made Prescriptions.
4. Expensive Ready-Made Prescriptions.

1. This represents the simple type of compounded prescription which so frequently comes to the prescription department. It consists of from two to four ingredients, the cost of which does not exceed a certain factor depending on the quantity. For the purpose of presenting

the thought, let us accept a 4-ounce liquid prescription, containing four ingredients, the cost of which, together with the container, is 25¢. The average time element for handling a prescription of this kind has been calculated at eight minutes, counting from the time of its receipt to the final wrapping and placing at the disposal of the customer. If we follow the simple procedure of doubling the cost and adding the time element, the minimum charge for a prescription of this kind would be 90¢. It is obvious that since the time-charge represents a definite and previously contracted expense, the 25 cent profit, which is less than 25% on the selling price, represents the only effort to obtain a profit on the transaction. This same principle is followed with each class and size of prescription.

2. This class represents the more expensive type of prescription. Experience reveals that the majority in this class do not rise in cost above $.50 including the container. Up to a cost of $.50 the same procedure is recommended as above, namely, double the cost, then add the time element. When the cost of materials rises above $.50, it is recommended that a profit of 50% of this amount which is over $.50 be added to the price of the prescription. This provision merely allows the pharmacist a reasonable profit on the extra merchandise used in the prescription and in thousands of cases has proven equitable and acceptable to all concerned.

3. This class represents ready-made preparations of all types, the cost of which does not exceed a certain cost-factor for any given amount. To this is added the time element, which varies slightly with each quantity. Here, as in Class 1, minimums are established. When the cost of materials or the time element is such as to increase the price of a prescription, it automatically falls into Class 4.

4. This class deals with the more expensive types of ready-made preparations; that is, those prescriptions the cost of the ingredients of which, rise above the cost-factor which would keep them in Class 3. A low cost calls for a high margin of profit which is in direct proportion to the time element plus a small profit as in Class 3. Before applying the principle of pricing in this group, the price should be checked back against the minimum price in Class 3. It is obvious, that unless the price in group 4 is higher than the minimum price given in Class 3, then the price in Class 3 must prevail.

In addition to these four groupings there are types presenting special features which must not be overlooked. These special features include those prescriptions the cost of which must be determined, principally, on a time basis; they may be represented as follows:

The time element is important in all compounded prescriptions and, especially, in such operations as require a relatively long period in the handling of the prescription; for example, the making of large amounts of hand-made pills. Herein the cost of materials is usually insignificant, but the time factor reaches an important notch in our calculation. Another example is in the making of enterically coated capsules. This type of prescription requires very careful handling; each capsule must be handled twice and in those cases where imperfections occur it is necessary to re-dip; hermetically sealed capsules present another example. The making of powders and capsules and many ointments (the latter frequently requiring long levigation) present more of the problems in reaching a satisfactory conclusion as to price. Emulsions, Infusions and Decoctions are three more classes which must be treated separately. Careful examination of the time factor reveals that as a rule half more time is necessary to handle these classes of products than for ordinary compounded liquid prescriptions.

The author is certain that every pharmacist is daily confronted with the problem of adjusting the price of a prescription when the patient requests an increased quantity, for an example, two or three times the original. It will be admitted that the time for compounding a larger amount of a liquid preparation is very little more than for the smaller quantity. Granted it does take somewhat longer to

weigh or measure a larger quantity in most cases but not in the same proportion as many believe. Therefore, in establishing a professional fee for an 8-ounce-prescription compared with a 4-ounce preparation, a careful adjustment of the time factor must be made.

In the case of powders and similar preparations the time spread is greater, owing to the amount of work necessary in distributing, folding and handling. In the distribution and filling of capsules and in the massing, rolling, cutting and shaping of pills, there also is an important time factor to be considered for each additional quantity.

These well-known cases are cited to bring to the attention of the members the great need for a careful analysis of the prescription problems.

Two other questions require consideration:

1. Prescriptions calling for extemporaneous preparations from the U. S. P. and N. F. or other standard works.
2. Prescriptions ordered "over the counter" by the patient not on an official prescription blank, but as a memo from a newspaper clipping or book, some other form of publication, or given orally.

In example No. 1, a prescription is cited calling for Basham's Mixture. When the physician writes for 4-ounces of Basham's Mixture, it is equivalent to placing all of the ingredients for Basham's Mixture on the blank in the form of a prescription and requesting that it be compounded. The fact that the preparation is known under an official title does not obviate the necessity of handling it like any other prescription for a compounded preparation. In that event, then, the prescription should be priced like any other, coming under the heading of compounded prescriptions of the more expensive type.

As example No. 2: A call comes for two ounces of 20% Ointment of Ichthyol with 10 drops of Liquefied Phenol. Obviously, there is just as much work in the compounding of this type of order as though the call came on a regular physician's prescription, except that the work of numbering and labeling and the filing is eliminated. It is reasonable to believe that some consideration should be shown on prescriptions of this type, but depending on their nature, this difference should not exceed 25% in favor of the customer. Lastly, how shall those prescriptions be handled which contain, for example, two ingredients, one of which is unimportant therapeutically and employed as a color or introduced obviously for the purpose of preventing self-medication.

The author has watched with increasing interest physicians and patients alike, the effect from the lack of uniformity in prescription pricing. It is unfortunately true that in all too many cases the price placed on a prescription is little more than a gesture unsupported by any fact, judgment or reason. It is unquestionably true that irregular prescription pricing is the cause of much wonderment on the part of the patient, this inconsistency developing skepticism, creating doubt and encouraging the "shopping" practice, which in turn, through the pressure exerted through the price angle is responsible for a large number of substitutions as well as hurried operations which carry with them error and an exhibition of poor pharmacy. These vicious angles have been responsible for many pharmacists (lacking perhaps in the courage necessary to meet conditions of that kind) abandoning any active program in behalf of ethical pharmacy and resorting to merchandising practices which in

their belief were attended with fewer complications, less grief and an opportunity for greater profits than provided under the difficulties attending the operation of the prescription department.

Based on the above principles, a draft of a rational Prescription Pricing Schedule is submitted for the consideration of the Committee of Practical Pharmacy and Dispensing, expressing the hope that this work may prove helpful in giving retail pharmacists some information which is needed in the conduct of the Prescription Departments.[1]

PRESCRIPTION PRICING SCHEDULE.

CLASS A. Applied to inexpensive Compounded Prescriptions.

MINIMUM PRICES.

Liquids or Bulk Powders by Volume. Internal Use		Liquids or Bulk Powders by Volume. External Use		Capsules, Pills, Powders.		Ointments.		Suppositories.		Cachets.		Inunctions.	
Volume	Price	Volume	Price	No.	Price	Oz.	Price	Rectal-Urethral No.	Price	No.	Price	No.	Price
1 oz.	$.65	1 oz.	$.60	3	$.50	1/2	$.65	6	$1.00	3	$.60	6	$.90
etc.		etc.		etc.		etc.		etc.		etc.		etc.	

Aural-Nasal-Vag.		Dropper Bottle Prescriptions.			
		Internal		External	
No.	Price	Vol.	Price	Vol.	Price
6	$1.30	1/4 oz.	$.70	1/4 oz.	$.65

CLASS B. Applied to compounded prescriptions too expensive for pricing under CLASS A.

RULE FOR PRICING:

1. Determine the cost of each ingredient. Add cost of container.
2. (*a*) If cost of ingredients and container is not more than $.50, multiply by 2. (*b*) If cost is in excess of $.50, mulitply the first $.50 of the cost by 2, then add 1/2 of the amount over $.50.
3. Add Professional fee given below to obtain the price of the prescription. (Professional fee covers the element of time necessary for Inspection, Compounding and Labeling.)

PROFESSIONAL FEES.

Liquids or Bulk. (Fill in other classes here the same as given in Class A.)

Powders by Volume.

Internal Use Volume	Prof. Fee			
1 oz.	$.30	etc.	etc.	etc.
2 oz.	.35			
3 oz.	.35			
4 oz.	.40			

CLASS C. Applied to inexpensive Ready-Made preparations either Trade-Marked or Standard.

MINIMUM PRICES.

Liquids or Bulk. (Other classes to be filled in here the same as given in Class A.)

Powders by Volume.

Internal Use Volume	Price
1 oz.	$.55

[1] If desired, the author will be happy to supply all prices under Classes A, B, C & D; also regulations for the Prescription Department as well as a set of instructions for use and a special section on the prices governing the sale of Proprietaries, Tinctures, Herbs, Salts and other substances sold in the Prescription Department.

CLASS D. Applied to Ready-Made preparations whether Trade-Marked or Standard, too expensive for pricing under Class C.

Cost Including Container.	Percentage to Be Charged on Cost.	Selling Price to Customer.
$.20	200	$.60
.25	180	.70
.30	160	.80
etc.		

Explanation of Rule for Pricing under Class B; under 1:

It is assumed that a 4-ounce liquid preparation is dispensed for internal use, the cost of ingredients for which is $.35.
Multiply $.35 by 2 = $.70.
Now add the Professional fee for 4-ounce preparations under liquid preparations for internal use (1st column). $.70 plus $.40 = $1.10.

Explanation of Rule for pricing under Class B, under heading 2 (*b*).

It is assumed that 30 capsules are dispensed, the cost of ingredients for which is $1.50.
Cost = $1.50.
Multiply cost up to $.50 by 2. Add this to Cost: $1.50 plus $1.00 = $2.50.
Take 1/2 of the amount of cost over $.50. In this case the amount over $.50 is $1.00. 1/2 of $1.00 is $.50.
$2.50 plus $.50 = $3.00.

To this is to be added the professional fee. (Fee covering time element given under Class B.)

Professional Fee for 30 capsules is $.75.
$3.00 plus $.75 = $3.75, the cost of the prescription to patient.

SYRUP OF AMMONIUM MANDELATE.

BY B. FANTUS AND O. U. SISSON.

Mandelic acid, first introduced by M. L. Rosenheim (1) but a year and a half ago, seems to be taking the country by storm, both in the number of articles published and in the number of proprietary forms in which it is offered on the market. These signs augur well for the probability that a valuable remedy has been added to our armamentarium. The chief drawback in the present situation is the costliness of mandelic acid which reflects itself—multiplied, of course—in the price charged the patient for the proprietary preparation. This is particularly unfortunate, in view of the fact that mandelic acid must be administered in large quantities (8 to 12 Gm. daily) in order to produce the desired therapeutic effect.

With the hope of making it possible for the pharmacist to deliver a suitable product at a lower price than he would have to charge for any one of the proprietary preparations—which latter must necessarily include advertising charges—we are offering a formula for a Syrup of Ammonium Mandelate, with the hope that it might serve as a basis for discussion, criticism and possible improvement.

While A. L. Clark (2) advocates the sodium salt of mandelic acid, he admits that the objection to it is the large quantity of ammonium chloride that must be administered in conjunction with this salt in order to overcome the alkalinizing action of the base. It is obviously better, therefore, to employ ammonium mandelate. As this salt is hygroscopic, it is desirable that it be prepared extemporane-

ously; and this can easily be done by employing the principle used in the preparation of the official Solution of Ammonium Acetate.

While the formula offered might not be suitable for extemporaneous dispensing, it will be seen that it presents no difficulty whatever from the standpoint of preparation to the well-trained pharmacist. Ammonium chloride has been added to the formula to the limit of palatability for the purpose of securing acidification of the urine with the use of a smaller quantity of the expensive mandelic acid. We find saccharin necessary to make the product sufficiently sweet, in spite of the fact that we are using sugar as well as fluidextract of glycyrrhiza, a combination which, after numerous experiments, seemed to yield the best available disguising vehicle.

Compound Syrup of Ammonium Mandelate.*

Soluble Saccharin	1.00 Gm.
Ammonium Chloride	50.00 Gm.
Ammonium Carbonate, in hard translucent pieces (crushed)	80.00 Gm.
Mandelic Acid	200.00 Gm.
Sucrose	400.00 Gm.
Benzaldehyde	0.04 cc.
Oil of Fennel	0.10 cc.
Anethol	1.00 cc.
Fluidextract of Glycyrrhiza	175.00 cc.
Water, a sufficient quantity, to make	1000.00 cc.

In a capacious vessel mix the mandelic acid and ammonium carbonate with 400 cc. of warm distilled water; let stand until effervescence ceases. Dissolve the ammonium chloride, the saccharin and the sucrose in this solution by agitation. Add the fluidextract in which the oils have been dissolved, and finally a sufficient quantity of distilled water to make 1000 cc.

Average dose: 15 cc.
Each average dose represents:
3 Gm. of mandelic acid
0.75 Gm. of ammonium chloride

* The term "Syrup of Ammonium Mandelate" might stand for the same formula without the ammonium chloride, which might then advantageously be replaced by the same amount of sugar.

This preparation is to be used in tablespoonful doses freely diluted with water and taken four times daily. The dose should be increased, if necessary, until the urinary p_H is sufficiently low. It has been calculated that urine of p_H 5.7 requires a concentration of one per cent of mandelic acid, that at p_H 5.3 only one-half per cent is needed, and at p_H 5.0 one-quarter per cent suffices. The simplest way of determining whether a satisfactory acidity has been reached is by means of methyl-red solution: 5 drops of which added to 2 cc. of urine produces a red color when the acidity is satisfactory. If it is not, the color remains yellow or orange.

SUMMARY.

A formula is offered for the preparation of Syrup of Ammonium Mandelate which, with or without the addition of ammonium chloride as desired by the physician, may be readily and economically put up by the competent pharmacist.

REFERENCES.

(1) Rosenheim, M. L., *The Lancet*, 1, 1032–1037 (May 4, 1935).
(2) Clark, Anson L., *J. A. M. A.*, 107, 1280 (Oct. 17, 1936).

THE NEXT STEP.*

BY W. F. RUDD.

Any well-run business keeps a pretty close check upon its inventory. In war consolidation of ground won is usually a sine qua non for the next advance. In education comprehensive surveys of where we are, how we got there, and has it all been worth while are fundamental to success in the next venture. The researcher whose notes do not tell the whole story of what he has done usually flounders hopelessly.

Not many years ago pharmacy set for itself certain objectives which seemed worth while to those with even reasonable vision. A catalog of some of the more important items and an inventory of how much progress has been made in their accomplishment are necessary before any sort of program for the future can be satisfactorily formulated.

On the professional side of pharmacy with a highly commendable spirit of cooperation, the boards, the colleges, the AMERICAN PHARMACEUTICAL ASSOCIATION, and even some of the national organizations, whose main concerns are commercial, set high school graduation and the completion of a standard four-year course as the minimum requirements for the practice of pharmacy. Thus in two decades we have seen these requirements go from less than high school training and no required college work at all in most states to the complete fulfilment of these educational objectives in all but four states of the union. Truly an accomplishment of tremendous significance!

Professional recognition of pharmacy by the army, navy and public health service has long been another major objective. In the effort to realize this, national groups have worked in complete harmony. Not, however, until pharmacy put itself on a comparable educational equality with other professions were our claims seriously considered. Step by step the fight progressed until at least the principle for which we have striven has been almost completely recognized. With a limited number of well-trained pharmacists commissioned along with physicians and dentists in the army and the public health service, the service will be improved and the morale of pharmacy greatly strengthened. This has been a fine piece of team work. Hats off to those who have borne the brunt of the fight that has been waged across the years for its accomplishment. The future of the venture is in the hands of the few who will soon be commissioned. Their careers will be followed with profound concern by American pharmacy. If they do well, the service will be enlarged. If they fail, pharmacy will suffer a major defeat.

Objectives on the commercial side have centered largely around (1) legislation for price protection and fair competition, and (2), increase in sales volume. The legislation program beginning with fair trade laws in individual states saw one of the major objectives realized with the passage of the Patman Act at the last session

* Section on Education and Legislation, A. PH. A., Dallas meeting, 1936.

of Congress. Lawmakers, both state and national, are beginning to realize that for the greatest good to the greatest number the small man owning his own business must be given a fair chance in the terrific struggle for existence. At least a start has been made in this direction. May we be wise enough and honest enough to increase our contribution to the cause of public health as our economic security is strengthened. Unless we do, retribution will surely come to us.

The second economic objective, increase in sales volume, has been pursued relentlessly and not always, we fear, with due regard for its pharmaceutical significance. Indeed we must regretfully admit that its partial fulfilment is probably doing as much to threaten our toe hold on a professional status as any other influence in American pharmacy.

With this brief but reasonably accurate evaluation of some accomplishments which have in them the basis for genuine improvement in pharmacy we come naturally to the subject of this paper:

"The Next Step"—and it has an underscored question mark after it.

Who knows what the next major steps should be? Certainly the writer has no answer which he believes to be completely satisfactory. It is highly probable that no two groups in organized pharmacy would answer the question alike. The high-powered sales groups would most likely agree that better business methods and better salesmanship in retail stores should have first place in the agenda.

It is more or less common knowledge that among patent medicine manufacturers it is not uncommon for them to spend more than one-third of the retail dollar which their merchandise brings in order to make the buying public want their product. This, it seems to me, needs no further comment.

Perhaps no group has given more serious thought to what the next step should be than the Board members of the country. They, more than any other in the field of pharmacy, have the opportunity to see the composite nature of the work of the retail pharmacist. Picked as they are, largely from the best men in their respective states, they find themselves arbiters between the conflicting forces that are so profoundly disturbing the equilibrium of the profession. What would they say should be the next step? We really wonder about this and wonder what it would be if they made up their minds to answer fully and frankly; and the college deans and their faculties: could they reach any sort of agreement? and the retailers themselves? Have they been so hard-worked and so desperately distressed by economic pressure that they would ask only for more economic freedom? And after all, do not they constitute the group that should ask the question most insistently and most thoughtfully? Are they not the ones whose prestige has declined the most? Are not they the ones who down in their hearts deplore the present trend?—where an erstwhile dignified public health service is being prostituted and its representatives forced to be purveyors of shoddy merchandise, beer, wine and sandwiches. All of this, however, is merely a rehash of what we see in every journal and hear discussed whenever pharmacists meet. We have only restated the question that every thoughtful man among us can never quite get out of his mind. We have had the temerity to restate it in this group because we are fully persuaded that the best thought in American pharmacy must agree, and agree soon, on what some of our next major objectives shall be to save us from complete oblivion as a health service group.

There is probably no doubt in the minds of some of us that better training of the men and women who go into pharmacy will help. There is no doubt that remedial legislation will help. There is no doubt but the army and public health service, etc., is a definite step forward. All of these, as good as they are, do not solve some of the problems that are eating at the very heart of American pharmacy.

I am going to be bold enough to name what I am convinced, after thirty-five years of intimate contact with our problems, is at least one chief source of illness in the "body pharmaceutic." For the most part the brains in American pharmacy during the years with which I am most familiar, have used their influence at least indirectly to develop trade rather than the professional side of our work. To make money out of the practice of medicine, in the ministry, in teaching, in pharmacy or any other service profession, is a worthy objective so long as the methods used for doing it do not lower individual or group ideals. The making of money out of pharmaceutical connections has involved ethical and even moral risks that many men and even good men early in their careers have not had the strength to resist.

Some colleges of pharmacy, deans and their faculties, with little regard for pharmaceutical needs, have ground out hordes of mediocre graduates. Some Boards of Pharmacy heeding the demands for more and cheaper clerks to man the already far too numerous stores in their states, have licensed mediocre clerks, soon to become second-rate proprietors and therefore dangerous competitors.

Some wholesalers, by too liberal credit, have helped add to the already overcrowded condition in the drug business, and so it goes all down the line. Every link in the chain making it more and more difficult for pharmacy to follow its ethical objective.

The responsibility for this condition is yours and it is mine. The responsibility for a change of emphasis is also yours and mine. What then do I recommend as major "next steps?" My answer is, and it still has a sort of question mark after it, a ruthless decrease in the number trained in our pharmacy schools: fewer permitted by the Boards to qualify for practice; a reasonably rapid elimination of stores where pharmacy itself is practiced as a mere adjunct to general merchandising and then only for the respectability it confers; prohibition against the opening of new stores in any community already well served pharmaceutically.

"Are these steps practical?" you ask, and the question is well taken. I think so, although only when a sufficient number of pharmaceutical individuals and groups are willing to forego some of the loaves and fishes that go along with the prostitution of our privileges and duties as public health servants. I think so when some of the pharmaceutical idealism of the years that are gone gets possession of those of us in a position to influence the trends in pharmacy. I think so when our organizations are manned by those whose main concern is the service they may render an age-old profession, when we shift the emphasis from getting to giving.

REMEDIES OF THE DARK AGES.

Weird prescriptions concocted by pseudo-physicians in the Dark Ages for any type of malady or common ill, from headaches to the alleviation of a "woman's chatter," were described in a lecture December 3rd, to medical students of the Johns Hopkins University.

In a lecture on the history of medicine, Prof. Loren MacKinney, of the university staff, placed emphasis on the early types of human medicine. Of its three classifications—pharmacy, surgery and diet—pharmacy is the most important, he declared.

DR. CHARLES RICE.*

BY JOHN URI LLOYD.[1]

On the authority of Mr. Menninger, a prominent pharmacist of Brooklyn, acquainted with the incident, and fortified afterward by Mr. Rice's personal interviews with me, I make the following statement.

In 1865 or thereabout a warship from Japan came into New York harbor. The Bellevue Hospital was advised that a sick man on board this vessel needed attention, this man having been a general roustabout on the ship. The ship officers had no data whatever concerning the man, as to where he came from or his relationships. He was very ill and remained in the hospital for some length of time. On convalescing, inquiries were made as to his friends but without resulting in any information whatever. He stated that he was absolutely unknown to anyone in America, nor could they obtain any information as to his antecedents.

DR. CHARLES RICE.

During his convalescence he was put to work in the kitchen, accomplishing such work as cleaning kettles and pans and scrubbing around the kitchen, menial service in all directions. During this period he came into contact with the physicians of Bellevue Hospital, who were surprised to find he was acquainted with medicine and medicines as well as with pharmacy, and also that as a linguist he spoke and read many languages. Consequently he was taken from the kitchen and transferred to the library where he became interested in publications, systematizing them as they had never been systematized before, and also taking part in pharmaceutical and chemical manipulations of Bellevue Hospital. Within a reasonable time he became indispensable in all these directions and he was given charge of the laboratory as well as being made Librarian of the Hospital.

It was during this period that I visited him in Bellevue Hospital, this because of correspondence we had had relative to certain features of American materia medica, the Eclectic work therein, as well as concerning certain publications I was seeking to obtain for the Lloyd Library.

Need it be said that I was overwhelmed with the knowledge Dr. Charles Rice

---

* Presented by J. T. Lloyd, Section on Historical Pharmacy, A. PH. A., Dallas meeting, 1936, who stated as follows:

To account for the origin of this paper, I will explain that it is the stenographic record of a statement made by my father, about fifteen years ago, in response to my request that he tell me what he knew concerning Dr. Charles Rice. When the notes were transcribed I submitted the paper to my father for approval or correction. He made little if any change, but requested me not to make use of it during his lifetime. This paper I am now presenting.—J. T. Lloyd.

[1] The details furnished by Mr. Menninger were not referred to by me in discussions with Dr. Rice; this, because of their very personal nature which might have been unpleasant to him.

possessed regarding every phase of the subjects touching chemistry, pharmacy, medicine and languages.

Not long after that he was made Librarian of the College of Pharmacy in the city of New York. Then he became officially connected as trustee and practically the manager of the scientific phases of the College of Pharmacy and Library as well, which he reconstructed along systematic scientific lines. In it all he was exceedingly modest, never forcing himself on anyone, assisting every one he could and seemingly capable of doing so regardless of what phase or what subject touching science might be presented.

Naturally, the fame of this man extended. He took an interest in the pharmacopœial work and within a short time overtopped all others connected therewith. The preceding Pharmacopœia was a small book as is well known. They made Dr. Rice chairman of the Pharmacopœial Revision Committee. He began to work systematically and the forthcoming book under his name as chairman was a marvelous improvement over anything and everything that had preceded. It was while he was thus engaged that I came into close touch with Dr. Charles Rice. This by reason of the fact that Professor J. F. Judge, of Cincinnati, one of the Committee of Revision, failed to even answer letters. Dr. Rice wrote me and I assumed Judge's work, attending to it all from beginning to end and when completed requested Dr. Rice to ignore my name and let Judge have the credit therefor, which was done, excepting that in the introduction Dr. Rice thanked me for assistance I had given in the revision of the Pharmacopœia. Afterward in correspondence with me in a letter which I now have in my files, he mentioned the problem in connection with a great favor I had been able to show Dr. Judge in his business affairs. This is very personal and for the first time recorded.

During the interval from the time that Rice was carried from the warship to the Bellevue Hospital to his chairmanship of the Pharmacopœial Committee, Dr. Rice moved in all directions in New York City: he attended conventions; the students in Colleges and all connected therewith knew him; he was associated with Dr. Castle in the editorship of *New Remedies* published by Wm. Wood and Co.; his name was in print the world over, his picture likewise familiar to every one. Yet, never to my knowledge was there a man anywhere who recognized him or who knew anything of his history or who could connect him with science either as a student or professor, or who had any authoritative knowledge of him.

Dr. Fred Hoffman took much interest in that direction, discussing with me Dr. Rice's personality and wondering over the record of a man so accomplished and yet who seemed to be absolutely unknown previous to his arrival in New York. It had been reported that Dr. Rice was a graduate of a German university, Heidelberg, I believe, and when Dr. Hoffman returned to Germany he made it his business to look up the subject, and wrote me from Germany that he could find no evidence of a Charles Rice ever being graduated from any institution in Germany.

Thus I would say Dr. Charles Rice was an enigma, inexplicable, and I state this in the face of the fact that on his death a biography of Dr. Rice was published which carried details presumably of his early life, and which are in direct conflict with what I have herein written.

My last interview with Dr. Rice, for I had many confidential talks with him on subjects concerning medicine and pharmacy, was to the effect that I advised

him to take a rest, otherwise he could not maintain his health. I saw he was failing physically although his mind was as bright in mentality as it had ever been. Said he to me: "I can't rest by doing nothing." I suggested that he make me a visit and I would give him something to do that would be a rest and change. He replied that his duties there prevented his taking a vacation.

Finally, after he had been three times chairman of the Pharmacopœial Revision Committee, we were informed that Dr. Charles Rice was dead.

I wrote to him before he accepted the chairmanship for the third time and begged him not to accept it as it would be too great a strain. He had accomplished enough and sacrificed enough. To which he agreed, but still said his duty led him to continue the work in which, as I have said, he died.

In an interview with Dr. Rice at the time of the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in Saratoga, N. Y. (while *chairman* of the Revision Committee), he took me aside and said to me as we sat on a sofa together:

"Professor Lloyd, your work pleases me very much, our interviews and correspondence have been exceedingly pleasant and satisfactory. You may have wondered as to my personality as others have done. Let me tell you that my name, Charles Rice, as you know it, has been changed from the original name of my family. When I came to America and became an American citizen by choice, I felt it my duty as well as privilege to make my name in accord with the American language. The original name being German was Reis, meaning rice. I am an American citizen and this is to be my home permanently and I feel it is proper to have my name in accord with the American spelling of the word." I was in hope that he would continue and give me something of his past history. His object seemed to be simply to show me that as an American citizen he wished to be wholly American and that even in his name he had cut off all foreign affiliations.

In one of our early meetings I said to Dr. Rice, "I am informed that you fluently speak and read many languages. This I can hardly comprehend." His answer was—"Mr. Lloyd, for this I deserve no great credit. When I commenced with one and mastered that, Latin, German, French, Italian, Spanish, English, Russian, Sanscrit, and others all came easily. I deserve no great credit for more than the rudimentary learning of the first language acquired." To this I will add that I understood that Dr. Rice was engaged by the English government to translate Sanscrit in the direction of botanical work.

Now I have briefly given as a narrative for record as I know it, or as I have heard and believe it to be true, all that came to me concerning this remarkable man who came from the unknown into such prominent place. I have not attempted to touch his personality, nor have I been able to give a clear conception of his versatility in scientific lines: in every committee he was appointed on any subject of the Pharmacopœia he proved to be so well informed that he could offer helpful suggestions and criticisms even to men who had made a life specialty of the subject. Talented and highly educated as he was, he must, in the years of his acquisition of this knowledge, have met hundreds, perhaps thousands of men in scientific work, yet no man to my knowledge had ever heard of Dr. Charles Rice before he came into New York harbor. I never met a man who had previously known him or knew of anyone who had.

A UNIFORM SCHEDULE FOR PRESCRIPTION PRICING IN SOUTH DAKOTA.*

BY CLARK T. EIDSMOE.[1]

During a discussion of the problem of Price Stabilization at the 1935 Convention of the South Dakota Pharmaceutical Association, it was brought out that there is a very wide variation in the prices which are charged in different drug stores throughout the state. Not only is this condition apparent by making comparisons with stores in different sections of the state, but it exists even in the same section and not infrequently even in the same city. Several cases were cited of rather startling differences in the pricing of prescriptions. Instances were related of the same prescription being priced in different drug stores with variations in prices ranging from 100 to 200 per cent. Such a condition was admitted to be not only serious but one which is causing the public to look with considerable suspicion upon the profession of pharmacy.

In the professions of medicine, dentistry, osteopathy and chiropractic, charges are based upon fixed uniform schedules. The same is true in other fields. The garage man, the plumber, the painter, the printer and the barber all have fixed charges. The price of sugar, of coffee and of flour is uniform at all grocery stores. Certainly it is high time that prices in drug stores be made more nearly uniform by considering not only the cost of materials but a professional fee as well.

To make a start in this direction the South Dakota Pharmaceutical Association authorized the appointment of a committee with the specific assignment of presenting definite recommendations as to a uniform schedule of prescription pricing for consideration at the 1936 convention.

In order to establish a basis upon which to work, a questionnaire consisting of four prescriptions and five questions was prepared and sent out to ninety drug stores (about 25 per cent of the stores) in South Dakota with the request that the prescriptions be priced and the questions answered. The number of prescriptions was limited to four not because of any misapprehension that four would cover the field, but because it was believed that a better response would be forthcoming if the druggists were not asked to price too many. It was a part of the original plan to send out a different set of four prescriptions to a second 25 per cent of the druggists and perhaps to repeat the procedure with the third and again with the fourth 25 per cent, but lack of time prevented doing so.

The response to the questionnaire was better than had been anticipated. Fifty druggists took the trouble to reply, many of them offering suggestions which were of no small help to the committee. The replies to the questionnaire show that while the majority of the druggists are pretty well in line, there are a number whose prices are far too low and others whose prices are as much too high. To illustrate, one of the prescriptions was priced by one druggist at 50¢ and by another druggist at $3.00, which is too great a difference to be reconciled by even the most charitably minded.

In order to show the variations in the prices which might be charged for a single prescription the replies from 50 druggists are shown on the accompanying graphs.

---

* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.

[1] Instructor, Division of Pharmacy, South Dakota State College.

Prices are shown at the left and the druggists computing the prices are represented by the numbers at the bottom of the graph. The numbers represent individuals, that is, the number 5 represents druggist No. 5, and not 5 druggists as might be assumed.

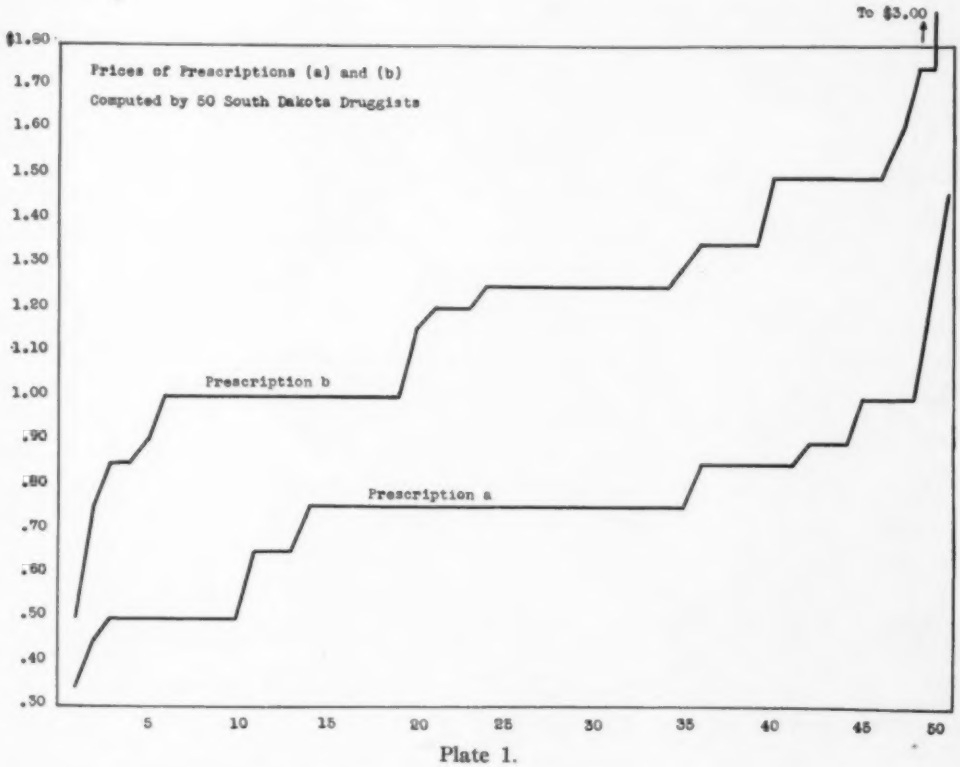


Plate 1.

Prescriptions *a* and *b* are shown on the first graph.

(*a*) ℞ Sacch. Ferr. Carb. gr. xxx
Quinine Sulfate gr. xxx
Ext. Nux. Vom. gr. vi
Extract Gentian gr. xv
M. ft. Capsules No. xv
Sig. One capsule before each meal.

Number of druggists pricing at a given amount.

Results:

1 @ $0.35	22 @ $0.75	1 @ $1.25
1 @ 0.45	6 @ 0.85	1 @ 1.50
8 @ 0.50	3 @ 0.90	
3 @ 0.65	4 @ 1.00	Average $0.75

(*b*) ℞ Amidopyrine dr. ii
Acetanilid dr. i
Citrated Caffeine gr. xxx
Codeine Sulfate gr. vi
M. ft. Chart No. xxiv
Sig. One powder every 3 hours.

The prescriptions themselves with a tabulation of the prices placed upon them by the druggists are shown herewith in addition to the graphic representation.

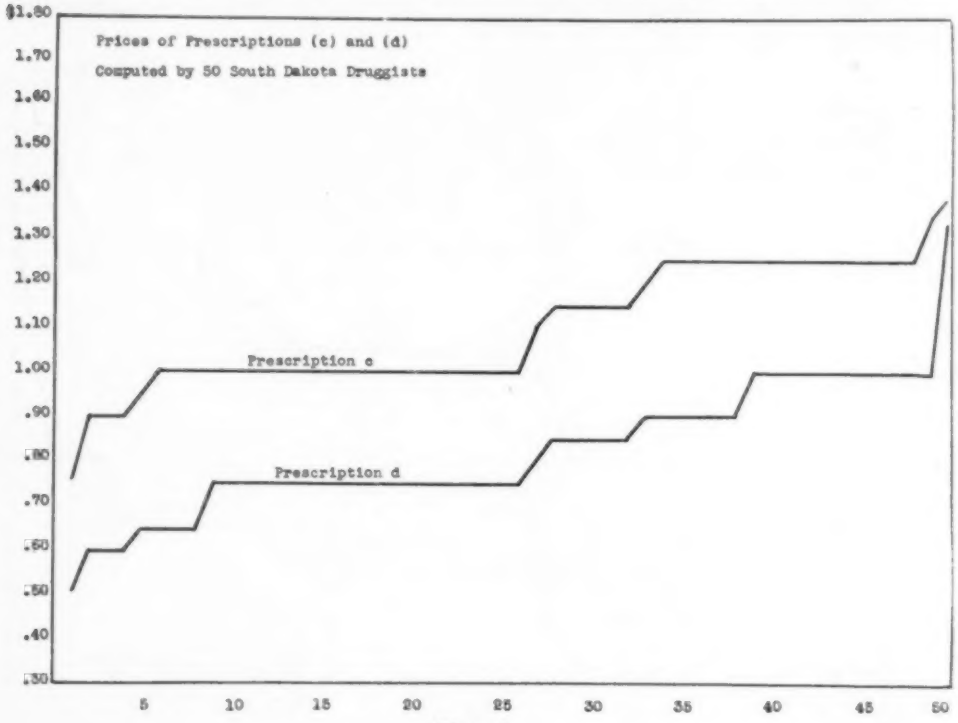


Plate 2.

Number of druggists pricing at a given amount.

Results:

1 @ $0.50	1 @ $1.15	7 @ $1.50
1 @ 0.75	3 @ 1.20	1 @ 1.60
2 @ 0.85	11 @ 1.25	2 @ 1.75
1 @ 0.90	1 @ 1.30	1 @ 3.00
14 @ 1.00	4 @ 1.35	Average $1.23

Prescriptions *c* and *d* are shown on the second graph.

(*c*) ℞

Ammonium Chloride	dr. iv
Tincture of Lobelia	fl. oz. iss
Syrup of Ipecac	fl. oz. iss
Syrup of Glycyrrhiza	fl. oz. ii
Distilled Water *q. s. ad*	fl. oz. vi

M. ft. Sol.

Sig. Teaspoonful every 2 hours as needed for cough.

Number of druggists pricing at a given amount.

Results:

1 @ $0.75	1 @ $1.10	1 @ $1.35
3 @ 0.90	5 @ 1.15	1 @ 1.40
1 @ 0.95	1 @ 1.20	
21 @ 1.00	15 @ 1.25	Average $1.10

(*d*) ℞

Chrysarobin	dr. i
Salicylic Acid	gr. xx
Ichthyol	dr. i
Ointment of Zinc Oxide	oz. ii

M. ft. Ointment
Sig. Apply locally at night.

Number of druggists pricing at a given amount.

Results:

1 @ $0.50	1 @ $0.80	1 @ $1.35
3 @ 0.60	5 @ 0.85	
4 @ 0.65	6 @ 0.90	
18 @ 0.75	11 @ 1.00	Average $0.82

This chart shows the

Answers to Questions 2, 3, 4, 5 and 6.[1]

2. Do you charge a compounding fee?

32—No
14—Yes
1—Yes and no
2—In some cases
1—Blank

3. Do you favor a compounding fee based on a given rate per hour for the time actually spent in compounding a prescription or would you favor a fixed fee for each operation?

30—Fixed fee	1—Either
7—Rate per hour	1—Neither
4—Yes	2—Blank
4—No	1—Don't know

4. How many prescriptions do you fill annually?

Lowest—300 Highest—13000 Average—2424

5. What is the inventory value of your prescription stock?

Lowest—$100.00 Highest—$3500.00 Average—$1137.65

6. Would you be willing to follow a pricing schedule if one is adopted by your association?

49—Yes
1—No

These replies show that although only a few druggists are now charging a compounding fee, a majority favor doing so. Likewise a majority of them favor a fixed charge for each operation rather than a given rate per hour. Only one druggist out of the fifty was opposed to following a pricing schedule if one were adopted. It was felt that while the opinion of only fifty druggists had been secured, these fifty probably were representative of the druggists throughout the state, and the committee acted in accordance with that idea.

As to the answers to questions 4 and 5, no comment is offered. The information is presented purely as a matter of interest with no attempt to draw conclusions.

In submitting the pricing schedule to its Association the committee was

[1] Question No. 1 consisted of the prescriptions aforementioned.

concerned only with the fact that it should fit the situation in South Dakota. Pricing scales now in use including the Secord Schedule, the N. A. R. D. Schedule, the Pacific Drug Review Pricing Schedule and several others less well known were studied freely, but it was felt that none of them were quite suited to the needs of the druggists of South Dakota. It was believed that the prices in these schedules were too high to receive favorable consideration from the South Dakota Association at this time. In the Schedule which was submitted the prices were for most part purposely kept lower than those in the schedules already mentioned. This was done in order that the change in prices would not be too radical and yet with the hope that the levels established would be fair to the customer and acceptable to the druggist.

The Schedule consists of three Sections, which are designated Section I, Section II and Section III, respectively. Section I lists *compounding fees only*, with full instructions for pricing compounded prescriptions. This is the Section which it is intended shall be generally used.

Section II lists *minimum prices*. It is intended as a check upon Section I. That is, a prescription is first priced according to Section I. The price arrived at is then compared with that listed in Section II. If the price computed according to Section I does not equal or exceed that shown in Section II the price in Section II is to be used. Section II is also to be used for pricing prescriptions which require no compounding.

Section III is for pricing ready-made items which are too expensive for pricing under Section II.

The following General Instructions are a part of the Schedule:

1. Cost is to be figured on the smallest unit of current wholesale prices. As an example—if an item may be purchased in gallons or pints the cost should be based on the price per pint.

2. The minimum cost of any ingredient shall be $0.02. Example—the exact cost of an ingredient is found to be $0.003. For the purposes of computation the cost shall be $0.02.

3. Any fractional part of a cent shall be considered as a whole cent. Example—the exact cost of an ingredient is found to be $0.052. For the purposes of computation the cost shall be $0.06.

The Schedules are shown on the accompanying charts.

PRESCRIPTION PRICING SCHEDULE.—SECTION I.

The *Sales Price* of the prescription = twice the cost of the ingredients (including the cost of the container) + the *Compounding Fee*. If the cost of the ingredients exceeds $0.80 multiply by 1.6 instead of by 2.

The minimum cost of any ingredient shall be $0.02. Any fraction of a cent shall be considered as a whole cent.

Compounding Fees Only.

Liquids, Internal Use.		Liquids, Liniments, Gargles, Etc.		Liquids, Eye, Ear, Nose and Throat Drops.		Capsules, Powders, Cachets, Pills.		Suppositories.		Ointments.	
Oz.	Comp. Fee.	Oz.	Comp. Fee.	Oz.	Comp. Fee.	No.	Comp. Fee.	No.	Comp. Fee.	Oz.	Comp. Fee
1/2	$0.20			1/2	$0.30	3	$0.25	3	$0.45	1/8	$0.25
1	0.20			1	0.35	6	0.35	6	0.75	1/4	0.25
2	0.25	2	$0.20	2	0.40	12	0.40	10	0.90	1/2	0.30
3	0.30	3	0.25	3	0.45	18	0.45	12	1.00	1	0.35
4	0.35	4	0.30			24	0.50	15	1.15	2	0.45
6	0.40	6	0.30			30	0.55	18	1.25	3	0.55
8	0.45	8	0.35			36	0.60	20	1.35	4	0.65
12	0.55	12	0.40			40	0.65	24	1.50	8	0.80
16	0.65	16	0.45			50	0.75			16	1.00
						60	0.85				
						100	1.25				

NOTE: Cost is to be figured on the smallest unit of current wholesale prices.

PRESCRIPTION PRICING SCHEDULE.—SECTION II.

To be used only for prescriptions which when priced according to "Section I" do not meet these levels, and for prescriptions which require no compounding

Minimum Prices.

Liquids, Internal Use. Compounded.		Liquids, Liniments, Gargles. Compounded.		Liquids, Eye, Ear, Nose and Throat Drops; Internal Preparations in Drop Doses. Compounded.		Liquids, Cough Syrups, Tonics. Ready-Made.		Capsules, Powders, Cachets, Pills. Compounded.		Capsules, Tablets, Cachets, Pills. Ready-Made.		Suppositories. Compounded.		Suppositories. Ready-Made.		Ointments. Compounded.		Ointments. Ready-Made.	
Oz.	Price.	Oz.	Price.	Oz.	Price.	Oz.	Price.	No.	Price.	No.	Price.	No.	Price.	No.	Price.	Oz.	Price.	Oz.	Price.
1/2	$0.40			1/2	$0.50			3	$0.45	3	$0.25	3	$0.75	3	$0.45	1/8	$0.35	1/8	$0.35
1	0.50			1	0.75			6	0.60	6	0.30	6	1.00	6	0.65	1/4	0.35	1/4	0.35
2	0.60	2	$0.40	2	1.00	2	$0.50	12	0.75	12	0.35	10	1.50	10	0.90	1/2	0.40	1/2	0.40
3	0.75	3	0.50	3	1.25	3	0.65	18	0.90	18	0.40	12	1.65	12	1.00	1	0.50	1	0.50
4	0.85	4	0.60			4	0.75	24	1.00	24	0.50	15	1.85	15	1.20	2	0.85	2	0.75
6	1.15	6	0.75			6	0.90	30	1.15	30	0.60	18	2.10	18	1.40	3	1.15	3	1.00
8	1.35	8	0.90			8	1.15	36	1.25	36	0.65	20	2.25	20	1.50	4	1.40	4	1.25
12	1.65	12	1.15			12	1.35	40	1.35	40	0.75	24	2.50	24	1.75	8	1.90	8	1.65
16	1.75	16	1.35			16	1.50	50	1.60	50	0.80					16	2.75	16	2.25
								60	1.85	60	0.90								
								100	2.75	100	1.35								

NOTE: Cost to be figured on the smallest unit of current wholesale prices.

To explain how the Schedule works the prescriptions sent out to the druggists are priced on the accompanying charts in accordance with the compounding fees and instructions for pricing given in Section I—page 1150.

PRESCRIPTION PRICING SCHEDULE.—SECTION III.

For ready-made items which cannot be priced according to Section II—Liquids, Ointments, Capsules, Pills, Tablets, Cachets, Suppositories.

Cost of Ingredients (Includes Container).	Selling Price Includes Container.	Cost of Ingredients (Includes Container).	Selling Price Includes Container.
0.20	0.50	1.50	2.40
0.25	0.60	1.60	2.50
0.30	0.70	1.75	2.70
0.35	0.80	2.00	3.00
0.40	0.90	2.25	3.40
0.45	1.00	2.50	3.75
0.50	1.10	2.75	4.15
0.55	1.15	3.00	4.50
0.60	1.20	3.50	5.25
0.65	1.30	4.00	6.00
0.70	1.35	4.50	6.75
0.75	1.40	5.00	7.50
0.80	1.50	5.50	8.25
0.85	1.55	6.00	9.00
0.90	1.60	6.50	9.75
1.00	1.75	7.00	10.50
1.10	1.85	7.50	11.25
1.20	2.00	8.00	12.00
1.30	2.10	9.00	13.00
1.40	2.25	10.00	15.00

NOTE: Cost is to be figured on the smallest unit of current wholesale prices.

HOW THE PRICING SCHEDULE WORKS.

				List Price.	Exact Cost.	Extension.
(*a*)	℞	Sacch. Ferr. Carb.	gr. xxx	$0.64 lb.	$0.002	$0.02
		Quinine Sulfate	gr. xxx	0.74 oz.	0.046	0.05
		Ext. Nux. Vom.	gr. vi	0.54 oz.	0.007	0.02
		Ext. Gentian	gr. xv	0.36 oz.	0.001	0.02
		M. ft. Capsules No. xv				
		Sig. One capsule before each meal.			$0.056	$0.11

Cost of ingredients	$0.11
Cost of container	0.04
	$0.15

Then

Twice cost of ingredients (including container)	$0.30
+ Compounding Fee	0.45
= Selling Price	$0.75

				List Price.	Exact Cost.	Extension
(*b*)	℞	Amidopyrine	dr. ii	$0.46 oz.	$0.115	$0.12
		Acetanilid	dr. i	0.05 oz.	0.006	0.02
		Citrated Caffeine	gr. xxx	0.19 oz.	0.018	0.02
		Codeine Sulfate	gr. vi	15.40 oz.	0.197	0.20
		M. ft. Chart No. xxiv				
		Sig. One powder every 3 hours.			$0.336	$0.36

Cost of ingredients	$0.36
Cost of container	0.04
	0.40

Then	Twice cost of ingredients (including container)	$0.80
	+ Compounding Fee	0.50
	= Selling Price	$1.30

(c) ℞

		List Price.	Exact Cost.	Extension.
Ammonium Chloride	dr. iv	$0.39 lb.	$0.012	$0.02
Tr. Lobelia	fl. oz. iss	1.80 pt.	0.168	0.17
Syr. Ipecac	fl. oz. iss	1.14 pt.	0.106	0.11
Syr. Glycyrrhiza	fl. oz. ii	0.40 pt.	0.05	0.05
Distilled Water *q. s. ad.*	fl. oz. vi			
M. ft. Sol.				
Sig. Teaspoonful every 2 hours as needed for cough.			$0.336	$0.35

Cost of ingredients	$0.35
Cost of container	0.04
	$0.39

Then		
	Twice cost of ingredients (including container)	$0.78
	+ Compounding Fee	0.40
	= Selling Price	$1.18

(d) ℞

		List Price.	Exact Cost.	Extension.
Chrysarobin	dr. i	$0.43 oz.	$0.053	$0.06
Salicylic Acid	gr. xx	0.66 lb.	0.001	0.02
Ichthyol	dr. i	0.47 oz.	0.058	0.06
Ung. Zinc. Oxid. *q. s.*	oz. ii	0.60 lb.	0.075	0.08
M. ft. Ointment				
Sig. Apply locally at night.			$0.187	$0.22

Cost of ingredients	$0.22
Cost of container	0.05
	$0.27

Then		
	Twice cost of ingredients (including container)	$0.54
	+ Compounding Fee	0.45
	= Selling Price	$0.99

The Schedule as submitted has been adopted by the South Dakota Pharmaceutical Association for one year. If it is found satisfactory it will probably be made permanent. The probationary period will afford opportunity to discover and correct any defects which are not now apparent, or in the event the Schedule is found to be unsatisfactory it provides time to bring forth ideas for other systems of pricing which may be workable. It is to be expected that a study of this nature will have to be carried on over a period of years, because to most of the druggists the use of a system of any kind is an experiment and it is not unlikely that a number of adjustments will be found necessary in order to secure a plan which is entirely satisfactory. Even if the Schedule which has just been adopted does no more than to stimulate thought along the lines of uniformity in prices it will still be a step forward and one which must lead to better conditions in the Profession of Pharmacy.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

ERNEST LITTLE—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

It has been the custom each year to publish in the A. A. C. P. Section of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, with as little editing as possible, the papers which have been read before the various conferences of teachers at the previous annual meeting of the A. A. C. P.

Suggestions have come to me from various sources that these papers, from year to year, have been taking on much more of a scientific nature than was originally intended for papers read at these meetings. The suggested thought is that all scientific papers might be presented to much better advantage in the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION, thereby leaving the time devoted to teacher's conferences available for the discussion of papers dealing more directly with teaching problems.

These suggestions have originated in our own group and I present them to you for your consideration.

Two papers read before the conference of Teachers of Pharmacognosy and Pharmacology at the 1936 Dallas meeting are presented below.—ERNEST LITTLE, *Editor*.

PRELIMINARY CHEMICAL INVESTIGATION OF THE BERRIES OF RHUS GLABRA LINNÉ.

BY G. H. MCFADDEN AND R. L. MCMURRAY.

Rhus glabra, commonly known as Sumac Berries, is defined by the United States Pharmacopœia, tenth revision, as the dried ripe fruit of *Rhus glabra* Linné, of the family of the Anacardiaceæ. The plant is popularly known as *smooth sumac* (1), *Pennsylvania sumac* (2), *upland sumac* (2), *Carolina sumac* (1), *common sumac* (1), *scarlet sumac* (1), (2), *sleek sumac* (1), (2), *senhalanac* (1), (2), *shoe-make* (1), (2), *white sumac* (1), (2), *vinegar tree* (1), (2), *mountain sumac* (2), *New England sumac* (3), *Buck's-horn tree* (1) and *der virginischer sumach* (1). The plant is indigenous to the central and eastern states of the United States. It is abundant on barren hillsides and waste ground throughout Ohio. The berry has been official in all of the United States Pharmacopœias except the ninth and eleventh revisions.

An extensive search reveals that the literature on the chemistry of this plant is rather limited and somewhat conflicting in content. The earliest work of a chemical nature so far uncovered was that of Cozzens (4), who concluded that "the acid of the sumac is malic, and that it is nearly pure, being only contaminated with a small portion of gallic acid." However, Rogers (5) proved that the malic acid existed in sumac as calcium acid malate. Almost seventy years later Frankforter and Martin (6) carried out the first analysis of the fruit, and found two different fixed oils from different parts of the fruit. Constants were determined on the oils and the percentage of moisture, ash, tannin, calcium acid malate and non-saponifiable matter reported. Brubaker (7) made an ether extraction of the fruit and reported constants of the oil obtained by this method of extraction. In 1925 Peacock and Peacock (8) made an extended investigation of the tannin of Rhus glabra, and reported it to be gallotannic acid.

EXPERIMENTAL.

The berries were collected the first week of December 1935. The place of collection was in the hilly region adjacent to U. S. Highway 40, in Licking County, Ohio, at a point 37 miles east of Columbus. The entire panicles were removed from the plant and transported in sacks. After drying, the fruit was shelled out by hand, culled until the fruits were separated and the non-fruit

portion was discarded. The berries were further air-dried at 30° C., after which they were cleaned by a motor-driven fanning mill. The milling removed 12.75 per cent of refuse matter from the fruits. Approximately five pounds of the cleaned berries were ground in a No. 6½ Quaker City mill. The material was further carefully reduced to a No. 20 powder with a No. 4 Quaker City hand mill.

(*a*) Moisture was determined by the Bidwell-Sterling (9) method and amounted to 5.25 per cent.

(*b*) A Dragendorff (10) selective solvent determination was made and calculated to both the air-dried and anhydrous condition (based on a moisture content of 5.25 per cent) as follows:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Petroleum ether	12.57	13.10
Ethyl ether (absolute)	4.64	4.89
Ethyl alcohol (absolute)	11.82	12.47
Distilled water (aseptically controlled)	6.75	7.12
NaOH (0.2 per cent)	3.74	3.99
HCl (1 per cent)	3.01	3.20
(*c*) Crude fibre (11)	31.86	33.62
(*d*) Pentosan (12)	21.61	22.81

(*e*) An ether extraction determination (11) gave the following results:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Total ether-soluble extractive	17.27	18.22
Volatile ether-soluble extractive	0.60	0.63
Non-volatile ether-soluble extractive	16.67	17.59
(*f*) Total nitrogen (12)	1.32	1.39
(*g*) Arsenic (12)	0.00	0.00

(*h*) Ash determinations gave the following results:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Total ash (11)	2.55	2.69
Acid-soluble ash (11)	2.27	2.39
Acid-insoluble ash (11)	0.28	0.30
Water-soluble ash (13)	0.95	1.00
Water-insoluble ash (13)	1.60	1.69
Alkalinity of ash (13)	2.04	2.15

(*i*) Ash Constituents: Sand and silica were determined by the A. O. A. C. (12) method. Iron (12), manganese (12) and copper (12) were determined colorimetrically from aliquot portions of the filtrates obtained in the sand and silica determinations. From aliquots of this same solution, aluminum (12) and magnesium (12) were determined gravimetrically, calcium (12) volumetrically and zinc (12) turbidimetrically. Sodium and potassium chlorides were determined by the A. O. A. C. (12) method. Sodium (14) was determined on a concentrated solution of the mixed sodium and potassium chlorides and reported as Na_2O. By calculation from the foregoing results, the potassium was determined by difference and reported as K_2O. Chlorides (12) were determined on a specially prepared sample. Sulphur (12) and phosphorus (12) were determined on a sample prepared by the sodium peroxide fusion (12) method. The following table is a summary of the results:

	Per Cent.		Per Cent.
Sand	2.95	Cu	0.000
Silica	7.44	Zn	0.078
Fe	0.86	Na_2O	4.16
Al_2O_3	4.67	K_2O	38.15
CaO	22.80	Cl	1.58
MgO	7.24	SO_3	7.15
Mn_3O_4	0.147	P_2O_5	21.17

(*j*) The constants of the oil obtained from the petroleum-ether extractive are as follows:

Refractive Index at 20° C.	1.4719
Density at 20° C.	0.9227
Optical Rotation at 20° C.	0.0000
Acid Value (11)	8.9700
Iodine Value (11)	87.1700
Ester Value (11)	150.2300
Saponification Value (11)	159.2000

REFERENCES.

(1) Gerth van Wijk, H. L., "A Dictionary of Plant Names," 1, 1146 (1911).
(2) Henkel, Alice, U. S. D. A., *Bur. Plant Ind., Bull.*, 26, 9–10 (1913).
(3) Gregory, G., "A Dictionary of Arts and Sciences," 3, page unnumbered (1882).
(4) Cozzens, I., "Annals of the Lyceum of Natural History of New York," 1, Part I, 42–45 (1824).
(5) Rogers, W. B., *A. J. P.*, 7, 56–62 (1835).
(6) Frankforter, G. B., and Martin, A. W., *Ibid.*, 76, 151–158 (1904).
(7) Brubaker, H. W., *Ind. Eng. Chem.*, 11, 950 (1919).
(8) Peacock, J. C., and Peacock, B. L., JOUR. A. PH. A., 14, 673–678 (1925).
(9) Bidwell, G. L., and Sterling, W. F., *J. A. O. A. C.*, 8, 295–301 (1925).
(10) Dragendorff, G., "Plant Analysis" (1894).
(11) "The Pharmacopœia of the United States of America," XI, 444, 445, 446, 473, 474, 475 (1936).
(12) *J. A. O. A. C.*, Methods of Analysis, 3rd Edition, 14, 15, 21, 102, 103, 104, 106, 107, 108, 109, 110, 111, 284, 285, 306, 307, 308, 309 (1930).
(13) Woodman, A. G., "Food Analysis," 3rd Edition, 20, 21 (1931).
(14) *J. A. O. A. C.*, 19, 71–72 (1936).

DRUG COLLECTING AND CULTIVATION IN MISSISSIPPI.

BY W. W. BARKLEY.*

Mississippi shows quite a diversity of plant life. We find rolling, treeless prairies in the Northeastern and Jackson Prairie Belts; hardwood forests in the Northwestern section, and extensive pine forests in the southern part of the state.

As is usually the case, we find in Mississippi one ecological factor predominating, *i. e.*, the soil.

Briefly considering the more important of these factors, we find—Mississippi, lying directly east of the Mississippi River and north of the Gulf of Mexico, is somewhat more than 300 miles in length North and South. This is sufficient to produce a noticeable difference between the flora of the northern and southern parts of the state.

Mariam[1] in his "Temperature Life Zone" places the entire state within the Austroriparian area of the Lower Austral Zone (although in the extreme northeastern corner are found a number of species which properly belong in the Carolinian area of the Upper Austral Zone). The winter temperature of the coastal region is about fifty degrees Fahrenheit, while in Northeastern Mississippi there is frost much of the winter. During the summer the temperature is above eighty degrees over the whole state.

* Kansas City College of Pharmacy, Kansas City, Missouri.

[1] Mariam, C. Hart, "Life Zones and Crop Zones," *Bulletin No. 10*, U. S. Biological Survey.

The altitude ranges from a few feet above tide water along the Gulf to an elevation of about 800 feet above sea-level in the northeastern corner of the state. This difference in elevation has, undoubtedly, an appreciable effect upon plant distribution.

All of Mississippi receives over fifty inches of rainfall per year, with the coastal region receiving about ten inches more.

Thus, we find a range of 800 feet in altitude and 300 miles in latitude, a variance of ten inches in rainfall and twenty degrees in winter temperature, with practically identical summer temperature. These ranges are sufficient to produce some of the diversity in vegetation, yet the marked dissimilarity of the various regions must be largely due to soil differences.

Topographically and geologically, Mississippi may be divided into ten more or less distinctly marked regions. Lowe[1] lists these as Tennessee River Hills, Northeastern Prairie Belt, Pontotoc Ridge, Flatwoods, North Central Plateau, Jackson Prairie Belt, Loess or Bluff Hills, Yazoo-Mississippi Delta, Long Leaf Pine Belt and the Coastal Pine Meadows.

Since there is little commercial demand for most of the drug plants, much of the supply of crude drugs comes from small collectors. Such collections have long afforded a gainful occupation for many people, especially in rural sections. Since colonial days, many plants have been regarded as having curative properties, although many are quite probably without virtue. These plants are, as a result, required in the manufacture of proprietary medicines, for home remedies, and in the case of many, in the regular drug trade. Plants having little commercial demand are usually supplied entirely by individual drug collectors.

In each community in Mississippi, there is usually at least one drug collector, often this collector is a negro. A major portion of the drugs collected by these people is sold into the regular drug trade. Most of the "negro doctors" collect their own drug plants as needed.

It has been noticeable that the natural supply of medicinal plants has been reduced as agricultural development has progressed. This has, however, reached a maximum in Mississippi, where very little land is taken into cultivation and large areas of land are being abandoned due to poor tilling and resultant erosion. On the abandoned land, a progression is in process which is resulting in the invasion of these areas by much of the original vegetation except in more spare stand. The result is that a few drug plants are to be found more abundantly now than formerly. Many species of drug plants are becoming rare, however. This is due to the avarice of the collectors and not the results of cultivation.

The supply of many species of drug plants is sufficiently abundant in many sections of Mississippi that their collection might be used to augment the family income. The plants that have become rare, such as ginseng, goldenseal and gold thread, have a relatively high market value and furnish good returns for the time expended. Also many others when occurring abundantly are well worth collecting.

The first rule[2] for collecting drug plants is that the collector be sure it is the

[1] Lowe, E. N., "Plants of Mississippi," a list of flowering plants and ferns. Mississippi State Geological Survey, *Bulletin No. 17* (Feb. 1921).

[2] Christenson, D. V., "Collection of Medicinal Plants in Florida," State of Florida, Department of Agriculture, N. S., 45, 1–32 (1930).

right plant he is collecting. In most cases negro collectors are fairly accurate in their collecting. However, the author has found cases of gross error—one instance in particular. "Ed" was found collecting *Commandra umbellatum* (L) Nutt. for *Coptis trifolia* (L) Salisb.

"All crude drugs, such as herbs, roots, leaves, barks, flowers and seeds should be carefully and thoroughly dried.[3]" They should be protected from molding and insect damage, and packed without intentional or unintentional adulteration, in clean containers.

Perennial roots, rhizomes, bulbs, tubers or bark are usually collected during the fall, winter or early spring; leaves and herbs (entire above ground portion) when the plant is in full bloom; and flowers when freshly opened. This means collections during most of the year. The negro drug collectors often wrongly collect bark and roots during the growing season instead of in winter, and leaves when the plant is in fruit.

Herbs are usually collected at the proper time, because they are heaviest then, and flowers (obviously) when in bloom. Negro doctors collect material preferably when needed, if available, although they usually have a small supply of dried drug on hand.

While interest in the possibility of successful cultivation of drug plants for market is growing in many parts of the United States, the author knows of no such enterprise in Mississippi, with the obvious exception of cotton. Even the production of naval stores, for which the state was famous, is at a stand-still. However, there is no reason why some of the drug plants in greater demand could not be grown profitably in many parts of the state.

A list of drug plants of Mississippi follows: These are the plants producing drugs that are more or less in demand and might be grown profitably. The first fifty or more drugs listed are in reasonably consistent demand, the remainder are only in limited demand.

MISSISSIPPI DRUG PLANTS.

Aletris farinosa
Aletris aurea
Myrica cerifera
Myrica carolinensis
Prunus serotina
Viburnum prunifolium
Sanguinaria canadensis
Caulophyllum thalictroides
Iris versicolor
Eupatorium perfoliatum
Arctium minus
Gelsemium sempervirens
Trilisa odoratissima
Nepeta cataria
Collinsia canadensis
Cimicifuga racemosa
Veronica virginica
Hydrastis canadensis
Panax quinquifolium
Chionanthus virginica
Coptis trifolia
Apocynum cannabinum
Datura stramonium
Cypripedium pubescens
Cypripedium parviflorum
Mentha piperita
Spigelia marilandica
Lobelia inflata
Podophyllum peltatum
Passiflora incarnata
Chimaphila maculata
Phytolacca americana
Xanthoxylum clava-herculis
Serenoa serrulata
Polygala senega
Ulmus fulva
Hydrangea arborescens
Rhus glabra
Mentha spicata
Chelone glabra

Gossypium hirsutum
Euonymus atropurpureus
Aralia racemosa
Dioscorea paniculata
Hamamelis virginiana
Liquidambar styraciflua
Capsicum frutescens
Monarda punctata
Pinus palustris
Ricinus communis
Stillingia sylvatica
Sassafras variifolium
Sambucus canadensis
Tilia americana
Smilax pseudo-china
Brassica nigra
Salix nigra
Verbena hastata
Asclepias tuberosa
Juglans cinerea
Eryngium aquaticum
Chamælirium luteum
Ilex verticillata
Leontodon taraxacum
Scrophularia marilandica
Cornus florida
Solidago suaveolens
Senecio aureus
Alnus rugosa
Marrubium vulgare
Ostrya virginiana
Ptelea trifoliata
Solanum carolinense
Erigeron canadensis
Arisæma triphyllum
Dryopteris marginalis
Hepatica acutiloba
Verbascum thapsus
Rumex crispus
Lactuca scariola
Oxydendrum arboreum
Gnaphalium obtusifolium
Betula lenta
Acorus calamus
Epigæa repens
Frageria virginiana
Fraxinus americana
Brassica alba
Quercus alba
Geranium maculatum
Chenopodium ambrosioides
Amanita muscaria
Gentiana lutea
Delphinium consolida
Drosera rotundifolia
Aralia spinosa
Ipomœa pandurata
Lobelia cardinalis

CONFERENCE ON VENEREAL DISEASE CONTROL WORK.

A conference on Venereal Disease Control Work was held in Washington December 28–30, 1936, under the direction of Surgeon General Thomas Parran of the Public Health Service. "The Section on Coöperation of the Private Physician in the Control of Venereal Diseases" was held in the AMERICAN INSTITUTE OF PHARMACY, 50 or more physicians being in attendance. These sessions were held under the chairmanship of Udo J. Wile, M.D., University of Michigan; W. W. Bauer, M.D., Bureau of Health and Public Instruction, A. M. A., served as secretary.

Papers were presented on "Teaching Venereal Disease Control in the Medical School," Paul A. O'Leary, M.D., of the University of Minnesota, and J. G. Hopkins, M.D., Columbia University College of Physicians and Surgeons.

"The Postgraduate Training of Physicians," Thomas B. Turner, M.D., Johns Hopkins, University School of Medicine; Carroll S. Wright, M.D., Temple University School of Medicine.

"Service Provided Physicians by the Health Department," A. J. Casselman, Bureau of Venereal Disease Control, New Jersey State Department of Health.

"The Physician and the Control of Prenatal Syphilis," A. B. Cannon, M.D., Columbia University College of Physicians and Surgeons; P. C. Jeans, M.D., U. of Iowa College of Medicine.

Dean Moursund, of Baylor University Medical School, Dallas, Texas, was in attendance at the sessions held in the AMERICAN INSTITUTE OF PHARMACY.

Many papers were presented in the various sections held in other buildings, dealing with all phases of the subject. The address of welcome was made by Surgeon General Thomas Parran, on "The General Purpose of the Conference."

Among the subjects discussed were, "Present Trends in the Standardization of Anti-syphilitic Drugs;" "The Value of Present Therapeutic Methods in the Control of Communicability;" "Prophylaxis."

Judging from those present at the INSTITUTE OF PHARMACY, there were several hundred in attendance at the sessions.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter. *Please advise us of changes in Roster and mail reports promptly.*

BALTIMORE.

The November meeting of Baltimore Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held at the School of Pharmacy of the University of Maryland on Thursday evening, November 19, 1936. This was the second meeting of the 1936–1937 season; approximately forty members of the Branch were present.

The meeting was called to order by President Hewing; the minutes of previous meeting were read and approved. President Hewing introduced as guest speaker of the evening Thomas S. Smith of Wilmington, *chairman* of N. A. R. D. executive committee. Walter Morgan who also was scheduled as speaker, could not attend.

Mr. Smith is an alumnus of the University of Maryland, School of Pharmacy; having graduated with the class of 1912. His opening remarks were directed to changes which have taken place during the intervening years, and noting particularly the greatly increased and improved facilities now available for the instruction of students of pharmacy. To some of his more or less dignified former classmates, who were present, he paid his respects in a humorous vein. The principal theme of the speaker, in an extemporaneous address which followed, was the need for a more universal support by pharmacists of the two complementary national pharmaceutical organizations; the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists. Some of the objectives to which the N. A. R. D. is dedicating its efforts at this time were outlined, and the opinion expressed that even a partial attainment of these aims would result in much improvement in the lot of the average retail pharmacist.

Commenting on recent successful efforts of organized pharmacy in securing more favorable state and national laws for the protection and betterment of the profession, the speaker cited the fact that these advances had been coincident with increased membership in and support given those organizations which had been working for years in the interest of independent retail pharmacists. He urged that the two national associations, representing both the professional and commercial interests of pharmacists, should be strongly supported at this time in order that the march of progress already started might continue in full force until the major objectives of these organizations were fully achieved.

Following this address several members questioned the speaker regarding topics touched on, and on other matters in which his organization is interested. This led to a general discussion of current pharmaceutical problems, both commercial and professional.

At the conclusion of these discussions the business meeting was adjourned and refreshments were served. Social and professional contacts among those present were renewed.

R. S. FUQUA, *Secretary.*

CHICAGO BRANCH.

The monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held November 17th, at the University of Illinois College of Medicine.

The speaker of the evening was G. J. Klumpp, Merchandising Manager of McKesson-Fuller Morrison Company. He spoke on the subject of "General Drug Store Merchandising."

A general outline was given of the changes that have taken place in the selling of drug store merchandise during the past fifteen years.

The use of sale leaders was discussed and its merits pointed out. He spoke whole-heartedly against the trend of open prescription departments, claiming that this takes away certain mystery from the store that always has been an important factor from the druggists' standpoint.

Druggists were cautioned against becoming too technical in their discussions with the public. The necessity of buying right and using the proper methods to pass the merchandise on to the consumer was stressed.

The speaker discussed the various departments of the average drug store and gave advice on how to improve the sales in each department. The use of the proper window displays, featuring seasonable goods, outside advertising and careful attention to the clerk's selling methods were outlined.

In conclusion, Mr. Klumpp suggested an analysis of the space of the store and the proper arrangement or rearrangement of fixtures and merchandise to fit the conditions and type of sales of the individual store.

LAWRENCE TEMPLETON, *Secretary.*

NEW YORK.

The November meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on November 9, 1936, at Columbia University, College of Pharmacy. The meeting was called to order by President Schaefer. About fifty members and their guests were present. The minutes of the May meeting were read and approved.

The Secretary read his report as *chairman* of the Remington Medal Presentation Dinner Committee. On motion of Dr. Schaefer the report was accepted and a rising vote of thanks was accorded the chairman of this committee.

Treasurer Currens' report was deferred.

The applications of Isidore Wilson, Jacob Osterweil and Frank J. LaBarbera for membership in the A. PH. A. were received and forwarded to Secretary Kelly.

Chairman R. S. Lehman reported as follows:

The California and Illinois Fair Trade laws having been declared valid by the courts of those states will not be tested in the U. S. Supreme Court by their opponents.

The N. A. R. D., through its Committee on National and State Fair Trade acts, has directed Chairman Robert L. Swain, to instruct the Attorney for the Committee, Counsellor Herbert Levy of Baltimore, to prepare a brief, *Amicus Curiæ*, for presentation to the Supreme Court. The N. A. R. D. asks that all State and Local Associations support this action by their endorsements. In their communications the number of members in the organization should be stated.

The Robertson-Patman Law is being enforced by the Federal Trade Commission; complaints have been issued against firms for giving, and others for receiving special secret discounts to the exclusion and disadvantage of their competitors.

Representative Wright Patman states that he will introduce a bill at the next session of Congress designed to "keep the manufacturers out of the retailers' business and the retailers out of the manufacturers' business." The bill will further amend the Clayton Act by making it unlawful for any manufacturer or any affiliate of such manufacturer to directly or indirectly transport or cause to be transported in commerce any article or material produced by such manufacturer or by an affiliate of such manufacturer for sale or distribution at retail by the manufacturer or his affiliate. The proposed act to go into effect three years after enactment.

Regarding the Social Security Act, which becomes effective on January 1, 1937, as regards taxes under title 8, the same will be administered by the miscellaneous Tax Unit of the Internal Revenue Bureau. This tax attaches to the "wages" received by employees on and after January 1, 1937, and must be collected by the employer of the taxpayer by deducting the amount thereof

from the wages when and as paid. The employer is made liable for this tax whether or not it is collected from the employee. The tax imposed under the Title 9 became effective January 1st, last, and is being administered by the Income Tax Unit of the Internal Revenue Bureau. Title 9 imposes an excise tax on the employers of eight or more employees on each of twenty days during the taxable year, each day being in a different calendar week. Records must be kept.

The new Food, Cosmetic and Drug Act, will be reintroduced at the coming session of Congress. Senator Copeland through his representative Dr. Ole Salthe, has been receiving suggestions for the revision of this bill which is to retain its Number S. 5.

In California a strenuous fight to enact a Chain Store Tax Bill was on during the election, and appeals were made to the public to support the matter by voting YES on Proposition "22." The claim was made that the chain stores weakened the financial condition of the state by taking capital out of it to the centers of finance, Chicago and New York.

Warning has been issued by the N. Y. Pharmaceutical Council on the possession of untaxed alcohol. Alcohol removed from the original containers must bear a label showing the amount removed from the original container, the date of removal and other pertinent information. Records must be kept showing how much alcohol is used in the preparation of pharmaceuticals.

Dr. H. H. Schaefer reported that a resolution passed by the A. PH. A. provided for the rebate of fifty cents (50¢) per member to the Branch. He raised the question whether this would supply enough money to run the Branch and suggested that the Executive Committee consider it, together with the question of the geographical limits of the Branch.

He also announced that as local secretary for the 1937 convention he had received many offers from hotels, that he with the officers had been acting for the Branch, but that a committee should be appointed. This was referred to the Executive Committee.

David J. Mason read a paper on the "Cause of and Remedy for Poor Attendance at Local Branch Meetings." Because of numerous recommendations contained therein the paper was referred to the Executive Committee for consideration.

Mr. Steiger reported as follows:

"A patent was issued on October 6th to Adelia McCrea and assigned to Parke, Davis & Co., on the preparation of a drug useful for manufacture of ergot preparations, by inoculation of cereal culture medium with *Claviceps purpurea*. (No. 2056604.)

"Smith & Timmis report in the *Journal of the Chemical Society*, London (page 1166, 1936), the discovery of a new alkaloid, which is an isomer of the active water-soluble alkaloid, ergometrine. The new alkaloid has been named ergometrinine. It has but little clinical action. These results support the opinion that all alkaloids occur in pairs. In this case, as in the others, the inactive alkaloid can be converted by suitable treatment into the active isomer, and vice versa."

President Schaefer then introduced Sol Herzog, the guest of the evening, who addressed the branch on the topic "Some Implications of the Robinson-Patman Act." His highly instructive talk outlined the evolution of the Robinson-Patman Act in the Legislative and Judicial branches of government. He pointed out its advantages and disadvantages to both large and small businesses. After much discussion a rising vote of thanks was accorded the speaker and the meeting adjourned.

HORACE T. F. GIVENS, *Secretary*.

NORTHERN NEW JERSEY.

The first regular meeting of the Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the year was held at the Rutgers College of Pharmacy in Newark, New Jersey, November sixteenth.

At this meeting Dr. E. Fullerton Cook outlined the "Plan for Extending Information to the Physicians Concerning the Use of Official Medicines." This meeting was well attended. An interesting discussion of the topic followed the presentation of the plan. The efforts of this committee in bringing before the physicians the adequacy of the official medicines to meet the most of their requirements, needs the support of the better type of the pharmaceutical profession.

The branch voted to again present a banner to the local branch of the AMERICAN PHARMACEUTICAL ASSOCIATION showing the greatest percentage increase in membership during the year. This year the presentation was made at the annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION held in Dallas, Texas.

The regularly scheduled date for the opening of the activities of this branch was October nineteenth, but the New York Branch had chosen this date for their presentation of the Remington Medal. The Northern New Jersey Branch was well represented by their attendance at that meeting.

The officers of the Northern New Jersey Branch, A. PH. A. are: *President*, Adolf Marquier; *Vice-President*, Robert W. Rodman; *Secretary*, Cyrus L. Cox; *Treasurer*, Sebastian B. Mecca.

CYRUS L. COX, *Secretary*.

PHILADELPHIA.

Commissioner Harry J. Anslinger, of the Federal Bureau of Narcotics, was the guest speaker of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, at its November meeting, which was held in the museum of the Sullivan Memorial Library, Temple University, November 10, 1936. President L. L. Miller called the meeting to order.

"Narcotic Traffic" was the subject of Commissioner Anslinger, and it proved to be a most interesting address. The speaker pointed out the valuable work of the League of Nations in reducing narcotic traffic, particularly with respect to heroin. It was interesting to learn that more legitimate narcotics are being used in the United States than previously, the reason for this is uncertain.

He pointed out that Marihauna smoking is on the increase. It was stated that narcotic users could be and are being cared for and brought back to society in federal institutions. Interesting pictures were shown to illustrate the Commissioner's lecture.

After the close of the lecture questions were asked by members and answered by the Commissioner.

Prior to the meeting, an informal dinner was held in the Faculty Dining Room of Mitten Hall, Temple University, with 33 persons attending.

GEORGE E. BYERS, *Secretary*.

DECEMBER.

The December meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was called to order at 8:30 P.M., December 8, 1936, by President Lawrence L. Miller, in the auditorium of the Philadelphia College of Pharmacy and Science.

The minutes of the November meeting were read and approved.

A communication was read from Secretary E. F. Kelly of the parent body, in which he advised that according to a motion passed at the Dallas meeting, the custom of remitting to the local branches, of a dollar for each new member in the parent body would be discontinued. Instead, each year, there would be remitted to the local branch, fifty cents for each member who also belonged to the parent body. The fifty cents to be applied to the member's dues, rebates to start December 1, 1936. The secretary pointed out that this would be better for the branch. Upon a motion by Nichols-Hunsberger it was decided that this fifty cents be placed in the treasury but that the members should continue to pay the regular annual dues.

Mrs. Nellie Perry Watts was elected to membership.

Upon motion by Munch-Hunsberger, Dr. J. Oren Mikle, of 3032 Alabama Road, Camden, New Jersey, was elected to Honorary Life Membership in the Philadelphia Branch.

The secretary was instructed to write Drs. Swain and Kelly relative to the reimbursement of the Local Branch for the A. PH. A. membership prizes, offered by Dr. Swain to that member of the Senior class making the highest average in law in the School of Pharmacy, Temple University.

The secretary pointed out that the Local Branch has not been reimbursed for the past three years and consequently the persons are not being advised of meetings.

James C. Munch presented a summary of certain activities that have come up in Washington during the past two weeks. He said a monograph on aconite was to appear soon. This monograph is printed under the auspices of the A. PH. A. at two dollars per copy.

Chairman Cook informed that the annual supplement of the U. S. P. XI would appear January 1, 1937, to be effective six months later.

President Miller introduced the speaker of the evening, Robert W. Rodman, managing editor of *Druggists Circular*. His topic was "The Pharmacist's Defense against Consumer Coöperatives."

He traced the birth and history of the consumer coöperative movement. The rules governing the coöperatives as laid down by the original 93 weavers were as follows:

1. Membership open to all.
2. Each member to buy stock, voting by the individual, each person having one vote.
3. Stock to pay a given percentage of interest.
4. Profits returned to purchaser in ratio to purchases.
5. Merchandise to be sold at current competitive levels.

Mr. Rodman said that 50% of the families of England belong to consumer coöperatives; that in Sweden in 1935, 35% of all business was done through consumer coöperatives. Mr. Rodman pointed out that in certain middle west states the movement has been rather successful. President Roosevelt sent a commission abroad to study the movement; the report of this study has not been released.

This consumer coöperative movement will no doubt spread in the United States and although it may not affect the retail drug trade as much as other trades the pharmacist should be on his guard to combat it. This could best be accomplished by studying current developments, by opposing the subsidizing of coöperatives by the government, and by the individual developing efficiency and professional service.

Discussion followed this most interesting address and Mr. Rodman was given a rising vote of thanks. Motion pictures followed.

Officers, Philadelphia Branch, A. Ph. A.: Lawrence L. Miller, *President;* H. Evert Kendig, *First Vice-President;* S. H. Kerlin, *Second Vice-President;* Geo. E. Byers, *Secretary-Treasurer.*

George E. Byers, *Secretary.*

PITTSBURGH.

The November meeting of the Pittsburgh Branch of the American Pharmaceutical Association was held on the evening of the 24th, at the Pittsburgh College of Pharmacy. Edward DeBone presided.

The group was addressed by Dean C. Leonard O'Connell on the subject, "Trends in Professional Pharmacy." During the course of his address, he presented to the group the definite plans of the pharmacopœial committee for extending information to physicians concerning the use of official medicines. The plans were freely discussed and the group decided to take an active part in this program, by contracting the medical practitioners through the local hospitals and the medical center. Reprints of the special articles appearing in the current issues of the *Journal of the American Medical Association* were made available to the members.

Frank S. McGinnis, *Secretary.*

UNIVERSITY OF MISSISSIPPI STUDENT BRANCH.

The October meeting of the University of Mississippi Student Branch, American Pharmaceutical Association was held in the College Inn. An informal dinner preceded the meeting and the Branch had as its guests Mrs. E. L. Hammond, wife of the Dean of the Pharmacy School; Mrs. W. W. Johnson, wife of the Professor of Pharmacognosy; the latter is a graduate of the University of Mississippi School of Pharmacy and an assistant instructor in Pharmacy.

After dinner President Joe Duckworth took charge. After a few words of welcome he presented Tony Rosetti who acted as master of ceremonies; he presented John Ward who spoke on the History of Pharmacy Week. The next speaker was Dean E. L. Hammond, who spoke on "The History of Pharmacy Schools."

The next on program was a satire on Pharmaceutical Education by Tony Rosetti; he concluded with a eulogy of a pharmacist.

The meeting was turned over to President Duckworth. He appointed a committee to construct a float for the A. Ph. A. in the Home Coming Parade on October 24th when the University of Mississippi played Catholic University.

The Committee that built the float consisted of: Joe Duckworth, John Ward, Middleton Longmire, Tony Rosetti, Bill Hossley, Ben Fink; the professors of the School of Pharmacy gave help and material.

The float was constructed upon a 1936 model International Truck. Although the Branch did not win first place, the float was said by the student body to be the most unique and attractive in the parade.

Several of the A. PH. A. members volunteered to help the druggists of Oxford make up display windows for Pharmacy Week. Malcolm Posey, a new member of the Branch and owner of a prescription pharmacy in Oxford, had two very attractive windows on Pharmacy Week. The Furr Drug Company had another good window, one of the firm was a member of the Branch until he finished last June.

MIDDLETON LONGMIRE, *Secretary.*

PITTSBURGH COLLEGE OF PHARMACY STUDENT BRANCH.

The Pittsburgh College of Pharmacy Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its regular meeting November 20th. The meeting was opened by acting chairman Robert C. Kealey. He called on Dean C. Leonard O'Connell, of the School of Pharmacy, who made several preliminary remarks on the origin of the AMERICAN PHARMACEUTICAL ASSOCIATION. He then introduced the speaker, Dr. George D. Beal, assistant director of the Mellon Institute and president of the ASSOCIATION.

The subject of Doctor Beal's address was, "The Importance of Organization in Pharmacy." He brought out the complexities of modern pharmacy, as contrasted with the dawn of civilization when man went forth in search of food to assuage his hunger, and medicines to relieve his pains. Down through the savage states with the "medicine man" with his dances and hideous masks and costumes, into civilized life as it is to-day with large laboratories, hospitals and modern pharmacies. The speaker recalled his boyhood days as an apprentice in the drug store when he performed the many menial duties and tasks required of him. Dr. Beal pointed out the value of organization in the progress that has been made and closed his address by citing the two fundamental and basic purposes in organization. The first, he pointed out, might be considered a purely selfish one, in that organization aids the individual in advancing more rapidly, building better business, improving working conditions and restricting unfair competition. The second reason is a social one. It has to do with professional pride and the natural love of the field.

He commended the Student Branch Movement and urged the members of the School of Pharmacy Branch to even greater efforts.

At this time Dr. O'Connell introduced Secretary J. B. Pilchard of the Pennsylvania Pharmaceutical Association. He expressed great optimism on the future of pharmacy and stated high approval of the Student Branch movement.

An announcement was made by Chairman Herman Leven, of the Student Branch Entertainment Committee, relative to the Annual Dance to be held December 15th at Chartiers Heights Country Club.

Frank S. McGinnis, faculty advisor to the Student Branch, and secretary of the Pittsburgh Branch, announced a meeting for November 24th at which time Dr. O'Connell will speak on "Trends in Professional Pharmacy."

ROBERT C. KEALEY, *Acting Chairman.*

ST. JOHN'S UNIVERSITY.

Secretary Isabelle Seismann advises that an interesting program has been arranged and the Branch is anticipating a successful season.

(Reports of Branches to be continued.)

THE PHARMACOPŒIAL HEARING.

BY E. FULLERTON COOK, *Chairman.**

As widely announced, the members of the Executive Committee of Revision of the Pharmacopœia held a hearing and conference in Washington on November 30th and December 1st. The titles under review for possible revision and re-publication in the "First U. S. P. Annual Supplement," to appear on January 1, 1937, had been announced some weeks ago. These were widely published in the pharmaceutical press and sent by direct mail to all who expressed an interest.

* U. S. P. Committee of Revision.

In the meanwhile the Sub-Committees had studied the proposed modifications and submitted a number of recommendations. These were embodied in page proof, which was distributed about ten days before the hearing. This page proof became the subject of first consideration at the hearing, and each monograph was specifically discussed.

The success of the plan is assured by the great interest and large attendance, and the splendid spirit of coöperation. The members of the U. S. P. Committee of Revision entered freely into the discussions describing many experiments and the results of their investigations. The discussions were stenographically reported and will be made available to all members of the Committee of Revision and those who were present.

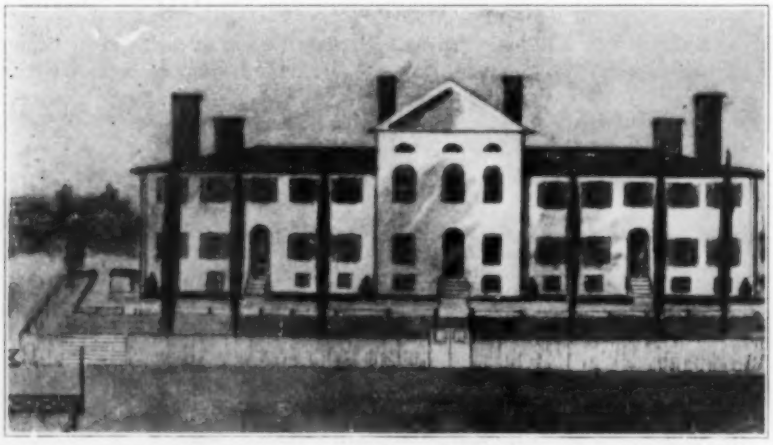
There were three public sessions, continuing until late on the evening of November 30th. On Tuesday, December 1st, the members of the Executive Committee of Revision met with the officials of the Food and Drug Administration and informally discussed the proposed revision of U. S. P. monographs. In the afternoon the members of the Committee of Revision reassembled and in the light of all facts made available by previous studies and conferences, decided on practically all changes to be submitted to the General Committee of Revision for approval and for publication in the "First Annual Supplement" to the Pharmacopœia.

This Supplement will be well printed and bound in pamphlet form, having the general appearance of the Pharmacopœia. This pamphlet, of approximately 100 pages, will be available only in a substantial spring binder, the binder being usable subsequently for future reprints.

No price has yet been fixed for the Supplement and binder, but it is expected that this will be maintained at approximately the cost of preparation.

MARINE HOSPITALS AND BENEFICIARIES OF THE PUBLIC HEALTH SERVICE.

An interesting and comprehensive historical article by Assistant General S. L. Christian, of the United States Public Health Service, appears in *The Military Surgeon* of September 1936. The latter publication has loaned the half-tones and granted permission to use the illustrations in the JOURNAL A. PH. A.; several of these are used with excerpts from the article.



First Marine Hospital built by the Marine Hospital Service at Boston, Mass., completed in 1803 and occupied in 1804.—Courtesy of *The Military Surgeon*.

"Prior to 1798 there was no organized system of providing medical relief for American seamen. The first marine hospital owned by the Marine Hospital Service was purchased from the State of Virginia in 1801. The second Marine hospital was built on contract by the Marine Hospital Service at Boston in 1803 and occupied in 1804."

"From 1798 to 1884 the Marine Hospital Service was supported by monthly contributions of money deducted from the wages of seamen. This deduction was at the rate of 20 cents per

month per man from 1798 to 1870 and 40 cents per month from 1870 until 1884. From 1884 to 1905 the hospitals were supported in part by tonnage taxes. Since 1905 they have been supported entirely by annual appropriations made by Congress.

"The New Marine Hospital at Norfolk, Va., was occupied on February 15, 1934.

"At present there are 26 marine hospitals, including two specialized institutions—a

Old Marine Hospital at Norfolk, Va., the first Marine Hospital owned by the Marine Hospital Service, purchased from the State of Virginia in 1801.

leprosarium at Carville, La., and the tuberculosis sanatorium at Fort Stanton, N. M. The other marine hospitals are located in Baltimore, Boston, Chicago, Cleveland, Ellis Island, Evansville, Ind., Galveston, Tex., Key West, Louisville, Memphis, Mobile, New Orleans, New York City, Norfolk, Pittsburgh, Portland, Me., St. Louis, San Francisco, Savannah, Seattle, Stapleton, N. Y., and Vineyard Haven, Mass.

New Marine Hospital at Norfolk, Va., occupied on February 15, 1934.

"These hospitals have a total of approximately 6000 beds and 278 physicans, 59 dentists, 522 nurses, 146 technicians and 268 consulting specialists, while 2034 other persons are required to provide the modern scientific medical, surgical, dental and nursing care to which marine hospital beneficiaries are entitled. In addition to these hospitals, the Public Health Service also operates 126 outpatient offices, or contract hospital facilities, in which 36 full-time and 110 part-time physicians and 51 full-time and part-time employees are on duty."

COMMITTEE REPORTS

REPORT ON THE NATIONAL FORMULARY.

BY E. N. GATHERCOAL, *Chairman.*

The following tabulation indicates the outstanding differences in content between N. F. V and N. F. VI and the changes that were made as N. F. VI evolved:

Comparison of N. F. V and N. F. VI as Regards:

	No. of Items in Each Class.			N.F. V Items Not Admitted to N. F. VI.	New Admissions to N. F. VI.	Occurrences per 10,000 Prescriptions.			
	N. F. I.	N. F. V.	N. F. VI.			Total N. F. V.	Total N. F. VI.	Loss.	Gain.
Plant Drugs	0	142	110	58	26	9.65	16.76	0.81	7.92
Animal Drugs	0	5	10	1	6	0.00	94.90	0.00	94.90
Chemicals	0	67	95	18	46	120.62	896.71	8.22	784.31
Total Simples	0	214	215	77	78	130.27	1008.37	9.03	887.13
Elixirs	86	66	54	21	7 + 2*	743.15	905.55	3.45	165.85
Liquors	41	37	32	17	12	128.19	225.97	2.02	99.80
Spirits	12	11	10	1	0	42.40	42.40	0.00	0.00
Syrups	35	38	25	21	8	159.06	251.45	0.81	93.20
Waters	3	2	5	0	3	12.46	16.96	0.00	4.50
Total Solution Preparations	177	154	126	60	30 + 2*	1085.26	1442.33	6.28	363.35
Extracts	2	14	14	7	7	28.30	90.02	2.38	64.10
Fluidextracts	52	105	72	44	11	36.28	57.31	1.47	22.50
Fluidglycerates	0	6	1	5	0	0.00	0.00	0.00	0.00
Infusions	2	4	3	2	1	5.40	14.20	0.00	8.80
Oleoresins	0	1	3	0	2	0.00	0.58	0.00	0.58
Resins	0	0	2	0	2	0.00	0.08	0.00	0.08
Tinctures	33	56	47	18	9	100.59	134.66	4.23	38.30
Vinegars	1	1	0	1	0	0.00	0.00	0.00	0.00
Wines	12	0	0	0	0	0.00	0.00	0.00	0.00
Total Extractive Preparations	102	187	142	77	32	170.57	296.85	8.08	134.36
Oleosaccharates	1	1	1	0	0	3.80	3.80	0.00	0.00
Pills	22	24	13	14	3	2.93	5.60	0.48	3.15
Powders	15	13	7	8	2	17.88	20.50	0.08	2.70
Salts	10	10	10	0	0	2.43	2.43	0.00	0.00
Tablets	0	8	48	5	45	10.44	565.52	1.28	556.36
Troches	0	2	1	1	0	0.00	0.00	0.00	0.00
Total Solid Preparations for Internal Use	48	58	80	28	50	37.48	597.85	1.84	562.21
Cerates	1	3	2	1	0	1.18	1.10	0.08	0.00
Collodions	4	3	2	1	0	0.08	0.08	0.00	0.00
Dressings	0	1	1	0	0	0.00	0.00	0.00	0.00
Glycerogelatins	0	5	1	4	0	0.00	0.00	0.00	0.00
Liniments	8	10	9	2	1	7.03	7.45	0.08	0.50
Lotions	4	7	6	2	1	54.93	56.20	0.33	1.60
Mulls	0	5	0	5	0	0.00	0.00	0.00	0.00
Oleates	4	2	0	2	0	0.00	0.00	0.00	0.00
Pastes	0	8	8	4	4	28.40	28.73	0.00	0.33
Petroxolins	0	18	3	15	0	1.34	1.18	0.16	0.00
Plasters	3	2	1	2	1	0.08	0.70	0.08	0.70
Ointments	5	19	21	3	4 + 1*	14.34	36.04	0.00	21.70
Total Preparations for External Use	29	83	54	41	11 + 1*	107.38	131.48	0.73	24.83

	No. of Items in Each Class.			N. F. V Items Not Admitted to N. F. VI.	New Admissions to N. F. VI.	Occurrences per 10,000 Prescriptions.			
	N. F. I.	N. F. V.	N. F. VI.			Total N. F. V.	Total N. F. VI.	Loss.	Gain.
Acids	2	2	2	0	0	6.00	6.00	0.00	0.00
Ampuls	0	8	29	0	21	1.41	2.07	0.00	0.66
Confections	0	2	0	2	0	0.66	0.00	0.66	0.00
Emulsions	11	6	4	3	1	3.54	3.46	0.16	0.08
Gargles	0	1	1	1	1	0.00	0.00	0.00	0.00
Gelati (Jellies)	1	0	1	0	1	0.00	5.90	0.00	5.90
Glycerites	7	5	6	1	2	0.41	0.66	0.00	0.25
Mels	0	2	1	1	0	0.08	0.08	0.00	0.00
Mixtures	19	13	4	7 + 2*	0	75.33	71.25	4.08	0.00
Mucilages	3	2	1	1	0	0.08	0.08	0.00	0.00
Nebulæ (Sprays)	0	5	4	3	2	0.08	80.88	0.00	80.80
Oils (Preparations)	3	6	4	2	0	0.70	0.00	0.70	0.00
Species (Teas)	3	3	0	3	0	0.08	0.00	0.08	0.00
Suppositories	0	1	1	0	0	0.40	0.40	0.00	0.00
Other Miscellaneous	27	27	14	15 + 1*	3	34.04	58.96	0.08	25.00
Total Miscellaneous Preparations	76	83	73	39 + 3*	31	122.81	229.74	5.76	112.69
Total Preparations	435	565	474	244 + 3*	153 + 3*	1523.50	2698.25	22.69	1197.44
Total Monographs	435	779	689	322 + 3*	232 + 3*	1653.77	3706.62	31.72	2084.57

* Titles have been changed so that the items are in other groups, but these are not new preparations.

Occurrences in Prescriptions.

	U. S. P. VI, 1886.	U. S. P. X, N. F. V, 1931.	U. S. P. XI, N. F. VI, 1936.*
U. S. P. Items	88.2%	65.19%	63%
N. F. Items	...	7.92%	17%
Official Items	88.2%	73.11%	80%
Unofficial Items	9.2%	10.84%	4%
Proprietary Items	2.6%	16.05%	16%
	100.0%	100.00%	100%

* Based on the 1931 prescription ingredient survey, but only approximate figures.

There are a large number of items in N. F. V that do not appear in N. F. VI. "Deletions" always bring criticism and that has been especially notable in connection with the Pharmacopœia, yet the pharmacopœial "deletions" during the last revision were only about 125. The National Formulary "deletions" were more than 300. More than 40 per cent of the total monographs in N. F. V were not included in N. F. VI.

The National Formulary Revision Committee established a definite foundation based upon "extent of use" and formulated certain rules for admission and "deletion." When the 779 monographs of N. F. V were brought under these rules, the loss was very great. This great loss occurred despite the fact that many items that are "pharmaceutical necessities," *i. e.*, items that enter into medicinal preparations, but in themselves may not be prescribed, were retained in N. F. VI. This group includes solvents, sweetening, coloring and flavoring agents, many "crude" drugs, some chemicals, etc.

On the other hand, these new rules encouraged admission of many new items. The totals in the tabulation indicate that N. F. V has 779 monographs, and N. F. VI, 689 monographs; 322 N. F. V monographs are not found in N. F. VI but 232 new monographs have been admitted to N. F. VI.

In the tabulation you will note columns for N. F. I, N. F. V and N. F. VI with the number of items of each class of medicinal agents.

Of plant drugs in N. F. I there are none; in N. F. V there are 142 and in N. F. VI, 110. Those "deleted" from N. F. V total 58 and the new admissions to N. F. VI are 26.

Of animal drugs in N. F. I there are none; in N. F. V there are 5 and in N. F. VI, 10. One is "deleted" and 6 new items are added.

Of chemicals in N. F. I there are none; in N. F. V there are 67 and in N. F. VI, 95. Those "deleted" total 18 and the new admissions, 46.

The pharmaceutical preparations in this tabulation present much of interest. We find some kinds of preparations, such as oleates, teas and wines that were used at the time of N. F. I, but that have entirely disappeared from N. F. VI. Other new groups, however, such as ampuls, tablets and sprays, appear prominently in N. F. VI, but were almost unknown at the time of N. F. I.

The preparations are arranged in groups, such as the Solution Preparations, Extractive Preparations, Preparations for External Use, etc. A study of the number of monographs in each of these groups in N. F. V as compared with N. F. VI will show that N. F. VI contains less in every instance, except the group of Solid Preparations for Internal Use; here the addition of 45 new tablet monographs brings about a marked increase. Corresponding conditions prevail in most of the individual kinds of preparations. For instance, we note that the elixirs drop from 66 in N. F. V to 54 in N. F. VI; the fluidextracts, from 105 to 72; the tinctures, from 56 to 47; the pills, from 24 to 13. The individual kinds that show marked increase in number are the tablets, from 8 to 48; the ointments, from 19 to 21; and the ampuls, from 8 to 29.

In the remaining columns of the tabulation are found the occurrences per 10,000 prescriptions. The loss by deletions and the gain by new admission are also set forth.

A glance at the first line indicates that the plant drugs may be used in preparations, but as such, they are used but slightly in prescriptions. However, despite the fact that there are 32 less monographs in this group, N. F. VI shows an increase in prescription usage over N. F. V of 82 per cent.

In the animal drugs, the addition of the powdered desiccated glandular products increases the occurrences from nothing to 94.90. In the chemical group the gain in occurrences is 784.31, or 650 per cent over N. F. V.

The next group, the solution preparations: elixirs, liquors, spirits, syrups and waters, shows a total gain of 363 occurrences for each 10,000 prescriptions, or 33 per cent over N. F. V. In the extractive preparations, the gain is also great, namely, 79 per cent above N. F. V.

In the next group of solid preparations, including oleosaccharates, pills, powders, salts, etc., notice the tablets, which show a gain of 556 points. The total gain of this group over N. F. V is 1613 per cent.

If you will turn to the final totals, you will find that whereas the total number of monographs has been reduced from 779 in N. F. V to 689 in N. F. VI a loss of 90, yet the total number of occurrences per 10,000 prescriptions has increased from 1653 to 3706, with a total gain of 2084.57 points or 225 per cent of N. F. V.

That is what we set out to accomplish. We wanted to get in those non-U. S. P. items that were used in prescriptions and thus reduce the great number of non-proprietary unofficials that were prescribed.

In the very last tabulation, under "Occurrences in Prescriptions," you will find there were no N. F. items in 1886. Of the total occurrences in prescriptions in 1886, 88.2 per cent were U. S. P. items, while proprietary items occurred only to the extent of 2.6 per cent. In 1931, the combined U. S. P. and N. F. occurrences constituted 73.11 per cent of the total, but occurrences of proprietary items had increased to 16 per cent. U. S. P. XI and N. F. VI—based, it is true, upon an approximation, and based on the 1931 prescription ingredient survey—show U. S. P. occurrences of approximately 63 per cent, N. F. occurrences of approximately 17 per cent, and unofficial occurrences reduced from 11 per cent to 4 per cent of the total. By including in N. F. VI the unofficial items that are quite extensively used in prescriptions, we have increased the usage of prescription items of an official character from 73 to 80 per cent.

The U. S. P. furnishes the great majority of the official occurrences in prescriptions, yet it is also true that the N. F. quite markedly helps out.

The gain from 7.92 per cent in N. F. V to 17 per cent in N. F. VI is nine points. Approximately 250 million prescriptions are compounded annually in this country. The average

number of items per prescription is slightly under three. Nine per cent of 750 million prescription occurrences is 67,500,000 occurrences. This represents the difference between N. F. V and N. F. VI.

We have taken the used unofficial items and have made them official, and thus have changed the picture.

You are already familiar with the changes in the arrangement of the book; it is no longer divided into Parts I, II and III, but the monographs are all arranged alphabetically. The historical section and the introduction, formerly found at the front of the book, are now found at the back, which appears to be a marked improvement. After the short preface come the general statements, followed by the monographs. So we start out with the monographs, as it were, at the very beginning of the book.

The changes in the monographs themselves are quite numerous. No formulas of the typical variety are found in the ampul, extract, fluidextract, oleoresin, resin and tablet monographs, a total of 168 out of 474 preparation monographs. General directions for manufacture are found in the general monographs (except for tablets) and specific directions in the individual monographs in each group. This avoids much duplication, yet provides for very complete and detailed directions in the general monographs.

Quite a considerable number of new assays have been added. The introduction of an assay in a preparation monograph just about spoils it, so far as the retail pharmacist is concerned. He almost invariably shies from making up any preparation that has to be assayed. However, the manufacture of pharmaceuticals on a large scale has become so extensive that very few retail pharmacists are concerned. Many pharmaceutical preparations need better standards, supported by tests and assay processes. In fact, the number of assays has so increased that we now present in N. F. VI a larger number of assays than are found in the U. S. P.

In the large new groups of tablets and ampuls, standards supported by assay processes are found in each monograph and this is one reason why the number of assay processes in N. F. VI is so remarkably increased. These assay processes have been extensively adopted from the work done by the Contact Committee, a joint committee from the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association. It would have been impossible for the Revision Committee to have prepared these monographs if these assay processes had not been available and had not been approved, quite largely at least, by the U. S. Food and Drug Administration. The Contact Committee very kindly gave the National Formulary full liberty to use these assay processes and, with that big start, we were able to introduce these two new sections into the National Formulary.

A great deal of work has been done on elixirs. Several of them have been assayed that were not assayed in N. F. V, and others have received very careful study from a number of standpoints.

The new vehicles represent a most interesting portion of N. F. VI. Dr. Bernard Fantus became deeply interested in the study of vehicles for medicaments, and he, with his collaborators, produced a number of new ones and improved some of the old ones. Their use in prescriptions should be encouraged.

One improved vehicle is syrup of licorice, a very old preparation, and yet one that frequently is not so pleasant. The N. F. V preparation had rather a bitter taste and an acridity that was not nice. We found the addition of oil of anise, a little fennel oil and a bit of benzaldehyde has improved the preparation so that the former rather bitter and acrid taste has been entirely masked.

Another remarkable improvement is in syrup of cinnamon, formerly made by extracting cinnamon bark and now made with oil of cinnamon. The oil is dissolved in the syrup and a little coloring added. The taste is much improved and there is no tannin present, hence it can be used with iron salts.

Then there is a great improvement in syrup of raspberry. This preparation has a rather high prescription usage, but around Chicago, at least, the pharmacists have been in the habit of getting their syrup of raspberry from the soda fountain. The method of preparation in N. F. V nearly always resulted in a "vinegar" of raspberry, and the syrup was far from being a pleasant preparation. By adding benzoic acid (1 in 1000), fermentation is prevented during the period when the crushed fruit is standing in a warm room to accomplish depectinization. Never use

sodium benzoate, because that gives an acrid taste, but benzoic acid gives no taste. If properly made, crushed raspberries make a syrup that is very fine.

The same thing is true with syrup of cherry. The cherry stones are crushed with the cherry pulp, one-tenth per cent of benzoic acid is added as a preserving agent and the mixture is allowed to stand for about twenty-four hours, during which time the pectin is all lost by enzymatic action. The strained and filtered juice is made up with sugar into a syrup which has a fine flavor. It has a number of advantages over syrup of wild cherry, particularly its freedom from tannin, although it will be a long time before it replaces syrup of wild cherry, which is certainly an old stand-by.

Iso-alcoholic elixir is another item of interest. It has been advocated by Dr. Fantus for twenty years. It is simply the preparation of two aromatic or simple elixirs, one strongly alcoholic, and one almost aqueous, but the elixirs have been so prepared that they will mix clearly in any proportion. The mixture of the two elixirs is to be of the alcoholic strength that is most suitable for the prescription, so as to prevent precipitation or insure complete solution.

REPORT OF THE COMMITTEE TO STUDY COURSES IN THE HISTORY OF PHARMACY.

In this first report of the Committee to Study Courses in the History of Pharmacy it should be stated that we are finding our way slowly.

It is the duty of this Committee to study the history of pharmacy courses, as they are now being offered, giving attention to their scope, time and content. A perusal of the catalogs discourages one from applying any such measuring sticks, very exactingly at least, to our history of pharmacy courses.

Professor Loyd E. Harris, of this Committee, performed the duties of the Committee with respect to the courses as described in the school catalogs. His report is summarized as follows:

Summary.

Number of school catalogs studied—44
Number of schools giving required courses in History of Pharmacy—23
Number of schools giving elective courses in History of Pharmacy—4
Number of schools offering History of Pharmacy as a part of another course—2
Number of catalogs of those studied not offering history of pharmacy courses—15
The time in the curriculum that the courses are offered is indicated in the following table.

	Semester Distribution of the Courses			
College Year.	First Semester.	Second Semester.	Both Semesters.	Totals.
Freshman	6	2	1	9
Sophomore	1	2	1	4
Junior	2	1	2	5
Senior	2	3	0	5
Graduate course	..	..	2	2
Totals	11	8	6	25

A summary of the hours of credits permitted in the history of pharmacy courses is as follows:

Credits.	Number of Schools.
One hour	6
Two hours	18
Three hours	2
Four hours	1

Such summaries as these should have included all of our schools but it is not an easy task for one person to get all of the catalogs in his possession at a time convenient to make such a study.

This number of catalogs is, however, a good cross section of our schools and this survey is significant. Almost one-third of our schools give no regular time to the study of the history of pharmacy. Those offering the course seem to have agreed that two semester credits is the proper time to devote to the subject. We shall not debate the problem except to say that history of pharmacy courses are obviously not in first rate standing with our curriculum builders. It deserves, we believe, to fare much better in the future than it has in the past.

CREATING INTEREST IN PHARMACY HISTORY.

In addition to presenting facts, as to our present courses, in the history of pharmacy, the Committee has assumed that it is to encourage and stimulate more and better work in this phase of our instruction.

By action of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION a standing committee on historical pharmacy was established in 1903 (PROC. A. PH. A., 51, 531). This committee was soon made into a Section on Historical Pharmacy. This section has held regular sessions at the annual meetings of the ASSOCIATION.

During these years about 500 papers have been presented covering at least 50 topics of pharmaceutical interest. Only a small number of these papers have ever been published. Very few of us have ever been exposed to the papers and discussions of this Section. We are not, therefore, stimulated in any large way to carry away ideas, pertaining to this field, to be made use of in the class room.

Of the fifty topics just mentioned, four-fifths of them are mentioned less than ten times.

Of the 500 papers about half of them are devoted to ten subjects. Those mentioned most frequently are biography, state associations, schools, drug plants, drug stores, manufacturing plants, laws and subjects of general pharmaceutical interest. These might suggest subjects of interest to be studied and upon which much valuable material is available.

AIDS TO INTEREST.

In an effort to be helpful the Committee is submitting a list of selected references upon the history of pharmacy, prepared by Prof. Edward J. Ireland, who is a member of the Committee and well qualified to compile such a list.

TEXTS ON THE HISTORY OF PHARMACY.

In recent years, much criticism has been offered concerning the methods and subject material employed in the teaching of the course in History of Pharmacy. The reason for some of the criticism is due to the fact that the methods of instruction in this subject are the least standardized of any of the curricular studies. Much more of the criticism is offered because many of the teachers have been negligent in keeping informed on the latest publications upon this subject. They have been satisfied to give assignments from one or two prominent treatises, and feel that these assignments fulfil the subject material required in the course.

Edward Kremers[1] has stated that there are not any treatises which have been written that may be truly styled a history of pharmacy. The truth of this statement becomes more apparent year after year as we witness the increasing number of books which have been published disclosing more source material on the subject of the history of pharmacy.

The committee feels that a greater interest would be manifested both by the teacher and the student if a larger number of treatises were available. In order to acquaint those who would wish to know more concerning the available literature, the following list has been compiled. It is, by no means, a complete list of all the books on the subject. It will be noted that the list is divided into the different languages to facilitate selection.

ENGLISH TEXTS (14).

"Chronicles of Pharmacy" by A. C. Wooton, Macmillan & Co., 1910. A very fine two-volume reference work, well illustrated. *Chemist and Druggist*, 33 Essex St., Strand, London, W. C. 2, England. $2.50.

---

[1] Kremers, E., Wisconsin Pharmaceutical Experiment Station, Form 38.

"Four Thousand Years of Pharmacy" by Charles H. LaWall, J. B. Lippincott Co., 1927. Illustrated.

"Pictorial History of Ancient Pharmacy." Translated by Wm. Netter from Hermann Peters' "Aus pharmazeutischer Vorzeit," 1889. The book is out of print but copies are still available.

"Historical Sketch of the Progress of Pharmacy in Great Britain" by Jacob Bell and Theophilus Redwood, 1880, London. 415 pp. This book relates only sketches of English Pharmacy. The first part was written by Mr. Jacob Bell in 1842 as an introduction to the Pharmaceutical Journal. May be purchased in England.

"History of the Society of Apothecaries" by C. R. B. Barrett, London, 1905. A very detailed history of the Society of Apothecaries from 1617 to 1780. Copies of this book may be procured through Henry Kimpton, Medical Bookseller, 263 High Holborn, London, W. C. 1, at about five dollars.

"The First Century of the Philadelphia College of Pharmacy, 1821–1921" by Joseph W. England, 1922. 728 pp. $5.00.

"The College of Pharmacy of the City of New York—A History" by Curt P. Wimmer, 1929, New York. 346 pp. $5.00.

"Early History of Pharmacy of America" by Otto Raubenheimer, published in *Medical Life* Magazine, Feb. 1926, Vol. 33, No. 2. 21 pages. The Froben Press, 12 Mount Morris Park, New York City. Much of the same material may be found in the January issue of the *Druggists Circular*, 1907. In the same number of *Medical Life*, which is known as the Pharmacy number, we find that Mr. Lascoff has written on the Later History of Pharmacy in America.

"Half a Hundred Years of Development," *Druggists Circular*, Vol. 51, 1907. Pages 1–194. The *Druggists Circular* celebrated their golden jubilee in 1907 and dedicated the January number of their journal to the history of pharmacy.

"Plough Court"—The story of a Notable Pharmacy published by Allen & Hanburys Ltd. This book gives an interesting history of the old Plough Court Pharmacy. It is illustrated and well documented. Copies may be obtained from Allen & Hanburys Ltd., Bethnal Green, London, E. 2, England. Price is $3.00.

"Reference Handbook of Medical Sciences," Vol. VI, page 580 (1903). An article by Charles Rice in this volume should prove of much value to those who are interested in the history of pharmacy from the point of view of pharmacopœial revision.

"Bibliographical Guide for the Students of the History of Pharmacy" by Edward Kremers, 1916.

"The Mystery and Art of the Apothecary" by C. J. S. Thompson, 1929. Bodley Head Press, London, England.

"Fighting Disease with Drugs" by John C. Krantz, 1931. Published by Williams & Wilkins. 227 pp. $2.00.

GERMAN TEXTS (20).

"Geschichte Der Pharmacie" by H. Schelenz. Berlin, 1904. "This standard treatise... of 935 pages is in some respects the most comprehensive treatise on the subject. Its index of 26,000 primes renders it of great value as a reference book on innumerable subjects pertaining to pharmacy. However, as the author himself points out, it should be regarded as 'an attempt at a history' rather than a history itself."

"Geschichte Der Apotheker" by Hermann Ludwig, 1858. Jena. 1122 pp. Ludwig's book contains the most extensive biographical data on the most outstanding pharmacists of Europe, during six centuries of pharmacy. It was the only translation of Phillippe's Histoire des Apothicaires ever made.

"Grundzuege Der Geschichte Der Pharmacie," by Carl Frederking. Göttingen, 1874. 303 pp. "This volume...of 303 pages by the Riga (Russia) apothecary was apparently inspired by the desire to counteract the influence manifested by the treatise of Phillippe, a physician, who apparently took great pleasure in casting ridicule on pharmacy in many of its phases. The author evidently sought the best antidote against such baneful influences in the biographies of men who had served pharmacy or at least emanated from the calling. Hence one-half of the volume is devoted to short biographical notices. The attempt at a general survey is best indicated by the reference to the table of contents."

"Aus Pharmazeutischer Vorzeit" by Hermann Peters, 1910. 2 vols., Vol. I, 305 pp. Vol. II, 287 pages. "The two volumes of essays, while not a general history of pharmacy, nevertheless should be mentioned here because they are replete with general information." These two volumes have been recently reprinted by the Gesellschaft für Geschichte der Pharmacie, and may be purchased by addressing Mr. Arthur Nemayer, Mittenwald (Bayern), Germany. Price $1.75.

"Geschichte Der Pharmazie" by Julius Berendes, 1898. Although planned on an elaborate scale and supplied with illustrations, yet only one fascicle ever appeared.

"Das Apothekenwesen" by Julius Berendes. "This title is chosen by the author to indicate that the text has reference to the historical development of Pharmacy in Germany. As an introduction he discusses much more briefly than in his 'Die Pharmacie bei den alten Kulturvoelkern,' the development of pharmacy during antiquity and the middle ages."

"Die Pharmacie bei den alten Kulturvoelkern" by Julius Berendes, 1892, 2 vols. These two volumes constitute the largest of his writings on the history of pharmacy. However, the subject material relates only to pharmacy of antiquity.

"Grundriss der Geschichte der deutschen Pharmacie" by Phil. A. Adlung and Georg. Urdang. Berlin, 1935. 647 pp. This treatise is of more recent date. It is a general history of pharmacy in Germany, and is sponsored by the Gesellschaft für Geschichte der Pharmacie in Germany. The book may also be secured from Julius Springer, publisher. Teachers interested in purchasing any of the books relating to the pharmacy of Germany would do well to write to Mr. Arthur Nemayer, Mittenwald, Bayern, Germany.

"Beiträge zur Geschichte der Pharmacie" by B. Reber, 1898, 54 pp. This small treatise is a reprint from the *Pharmaceutical Post*, a German pharmaceutical journal which devoted much space to the history of pharmacy.

"Wesen und Bedeutung der Geschichte der Pharmacie" by Georg Urdang and published through Julius Springer. Berlin, 1927. This small book consisting of 41 pages discusses the importance of the history of pharmacy. It may be secured directly from the Society for the History of Pharmacy in Germany. (See previous reference for address.)

"Versuch einer Geschichte der Apothekenwesens, 1792," 60 pp. Is another reprint of the "Gesellschaft für Geschichte der Pharmacie," which might be easily obtained by writing to the German society. In reviewing the German literature in the history of pharmacy it will be noted that there have been a large number of books written concerning the history of the apothecaries in the larger cities in Germany. These usually cover several hundred years of historical data, and may prove very valuable after one has consulted one of the more general texts on the history of Germany. Time will not permit even a short review of them, but the following list giving titles, date of publication, number of pages, etc., should be helpful in further acquainting the teacher with texts on German pharmaceutical history.

"Geschichte der Wiener Apotheken" by Josef Noggler and Leopold Hochberger, 1919, 2 vols.

"Münchens älteste Apotheke," published by Otto Harrassowitz. Leipzig, 1927, 60 pp.

"Die Apothekenreformbewegung" by Ernst Urban, 1929, 156 pp.

"Die Kölner Apotheken von der ältesten Zeit bis zum Ende der reichstädtischen Verfassung," 1918, illust., 159 pp.

"Beiträge zur Geschichte der Annaberger Löwenapotheke," by Harms Spreckel and Richard Bretschneider, 1930, 126 pp.

"Zur Entwicklungsgeschichte der Apothekenreform" by Dr. Springfield, 1896. Leipzig, 84 pp.

"Geschichte der Apotheker und Apotheken in alten Soest" by Gerd Hinrich Behlman, 1929, 230 pp.

"Geschichte der Hamburger Apotheken—Historische-Biographische Skizze von Jahre 1265 bis auf die neueste Zeit," 1888, 112 pp.

"Eine Deutsche Apotheke des 16 Jahrhunderts" by Richard Meissner, 1908, 397 pp.

Many of the above books may be obtained through the Gesellschaft für Geschichte der Pharmacie, while the remaining numbers can be purchased through German book dealers who will send their catalogs upon request.

A large amount of illustrated material which could be used in teaching the course might

be secured by purchasing the *Illustrierter Apotheker Kalender* annually at $1.00 each. These calendars have cuts on each page portraying important men and events in European pharmaceutical history.

FRENCH (16).

Information concerning the history of pharmacy in France may be obtained by corresponding with *La Société d'Histoire de la Pharmacie* in Paris. The address is 6, passage Verdeau, Paris 9.

This society has issued the "*Bulletin de la Société d'Histoire de la Pharmacie* since 1913 with a few interruptions during the World War. After the war it was resumed under the title *Revue D'Histoire de la Pharmacie*. Although it is written in French, teachers who subscribe for this little review of French pharmacy will not be disappointed.

FRENCH TEXTS (16).

"Histoire de la Pharmacie, Moyen age, Temps Moderne" by André-Pontier. Paris, 1900, Octave, Doin, Editeur. 729 pp. "Although by far the largest part of the volume is devoted to the history of French pharmacy, the work possibly contains a sufficient amount of other material to give it a place among the general literature."

"Histoire des Apothicaires" by A. Phillippe, 1853. "This, the first attempt at a general history of pharmacy, is the product of leisure moments of a physician. His principal endeavor was to assemble the scattered fragments to a united whole."

"Histoire de la Pharmacie A Travers les Ages" by L. Reutter de Rosemont, 1931, Vol. I, 596 pp., Vol. II, 670 pp. This two-volume work is perhaps the best general history of French pharmacy that has been published. While the first volume deals chiefly with the period of antiquity to the XVI century, the second volume contains a great amount of historical data dealing with the 17th, 18th and 19th centuries. Copies of this history may be purchased from J. Peyronnet & Cie, Ed., 7 Rue de Valais, Paris, France.

"La Pharmacie en Bas-Poitou" by Yvonne Michon, 1925, 190 pp.

"Les Maitres Apothicaires de Nancy au Dix-Septieme Siecle" by Emile Monal, 1917, 230 pp. This history may still be obtained from Berger-Levrault, 5 Rue des Beaux Arts, Paris, France.

"Les Apothicaires de Vitry-Le-François" by Jean Martin, 1932, 196 pp. This biographical history was published by "La Société d'Histoire de la Pharmacie," and should still be available.

"Histoire de la Pharmacie au Dunkerque de 1631 à L'an XI (1803)" by Edmond Leclair, 1927, 125 pp. Copies of this history are still available through Paul Michel, 23 Rue de la Marine, Paris, France.

"Documents sur les Apothicaires et Epiciers Lillois avant 1586" by Edmond Leclair, 1901, 27 pp.

"Contribution a L'Histoire de la Pharmacie en Normandie" by Andre Liot, 1912, 88 pp.

"Histoire de la Pharmacie à Avignon du XII Siecle à la Revolution" by Henri Granel, 1905, 87 pp.

"Les Apothicaires Parisiens au Seiziéme Siécle" by Emile Riviére, 1914, 55 pp.

"La Pharmacie la Rochelle avant 1803" by Maurice Soenen, 1910, 225 pp.

"La Pharmacie Centrale de France" by Charles Sellier, 1903, 265 pp.

"Centenaire de l'École Supérieure de Pharmacie de Paris, 1803–1903" compiled by the Faculty, 1903, 393 pp.

"L'Art Pharmaceutique A Travers les Ages" by F. Sternon, 1933. A copy of this book may be purchased from Libraire de l'Academie de Médecine, 120 Boulevard Saint-Germain, Paris VI.

"La Pharmacie dans ses rapports avec les Institutions d'Assistance à Paris et dans des principales Villes de France" by J. E. Pagnien, 1907, 259 pp.

LOYD E. HARRIS, EDWARD J. IRELAND, CHAS. O. LEE, *Chairman*.

REPORT OF THE COMMITTEE FOR THE COLLECTION OF INFORMATION PERTAINING TO PROFESSIONAL PHARMACY.*

The Committee for the Collection of Information Pertaining to Professional Pharmacy has not been as active during the year 1935–1936 as it was during the year 1934–1935. This was due in part to several reasons among which were (1) The necessary funds were not available to carry on extensive work. (2) As there was a new revision of both the United States Pharmacopœia and the National Formulary, a great many changes were being made and it was thought best that time be given to allow things to adjust themselves before continuing the work of collecting information by the committee.

As a result the committee has contented itself during the past year by making a special effort to enlist the many hospital pharmacists in this country to join the AMERICAN PHARMACEUTICAL ASSOCIATION and to encourage them to conduct dignified, scientific laboratories offering every assistance in the way of consultation, research, etc.

* Submitted by Rugnar Almin, Ralph W. Clark, Elmer L. Hammond, J. Solon Mordell, Emery T. Motley, M. T. Rowe, E. T. Stuhr, Ralph E. Terry and Marvin J. Andrews, *Chairman*.

Photograph of part of a display of preparations from A. PH. A. Recipe Book II, prepared by Chairman J. Leon Lascoff.

GERMANY HALTS ENROLLMENT IN DENTAL COLLEGES.

Pending adoption of new educational standards and having in mind the present large number of dentists in Germany a temporary prohibition has been instituted against further enrollment in dental colleges in that country, according to a report from Consul Sydney B. Redecker, Frankfort-on-Main, made public by the Commerce Department's Chemical Division.

Authorities are said to feel that the rapid increase in practitioners coupled with widespread dental illness throughout the country suggests that Standards of education in the profession have not been sufficiently rigid and that the situation requires more careful selection of students and higher standards of skill, the report states.

The number of dentists and dental technicians practicing in Germany has increased rapidly during the past quarter century. In 1909 the country had a total of only 2667 dentists and 8546 dental technicians; by 1934, the number had grown to 11,247 and 20,000, respectively, it was stated.

The temporary ban against new admissions to dental colleges does not include students training to be dental technicians, the Consul reported.—From U. S. DEPARTMENT OF COMMERCE, BUREAU OF FOREIGN AND DOMESTIC COMMERCE, November 19, 1936.

ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1936–1937.

Office of the Secretary, 2215 Constitution Ave., Washington, D. C.

November 25, 1936.

LETTER NO. 5.

To the Members of the Council:

32. Election of Members. Motion No. 5 (Council Letter No. 4, page 1040) has been carried and applicants numbered 44 to 60, inclusive, are declared elected.

33. Use of Text of N. F. VI. The following communication has been received from Chairman DuMez of the Committee on Publications:

"I have looked over the manuscript of the revised manual on Biological Assaying by Dr. Munch and recommend that permission be granted the publishers to use the portions of the text of the N. F. desired for comment. I also recommend that the book be required to carry the usual statement and that the usual fee of $5.00 be charged for this privilege."

(*Motion No. 6*) It is moved by DuMez that the J. B. Lippincott Company be given permission to use portions of the text of the N. F. VI in the forthcoming revision of a manual on Biological Assaying with the customary acknowledgment and the usual fee of $5.00.

34. Storage of Records of the Board of Trustees, U. S. P. Convention. The Board has forwarded to the ASSOCIATION for storage in its building and as a part of the U. S. P. records, the Financial Report 1900–1910; Reports of the Spanish Edition, 1909–1911; Correspondence with Chairman James H. Beal, 1909–1919; and Minutes of the Board, 1900–1920.

35. Meeting of the Council. The National Drug Trade Conference will hold its annual meeting in Washington on Tuesday, December 8, 1936. The officers of the Council and President Beal have decided that Monday, December 7th, will be the most satisfactory date for the meeting of the Council (see Item 14, Council Letter No. 1). Chairman Hilton has therefore called the meeting of the Council for Monday, December 7, 1936, at the AMERICAN INSTITUTE OF PHARMACY, beginning at 9:30 A.M. It is hoped that the business to be presented can be transacted during the morning and afternoon sessions. If necessary, an evening session will be held.

An order of business is being made up and a copy will be sent to the members of the Council during the next week.

36. Complimentary and Review Copies of the R. B. II. The Second Edition of the Recipe Book has been issued and is now being distributed. Ten thousand copies were printed and two thousand copies were bound. The type is being held.

The following letter has been received from Chairman DuMez of the Committee on Publications:

"In response to your letter of November 14th, it is stated that I am in accord with your suggestion that complimentary copies of the Recipe Book II be sent to the Recipe Book committee, to the members of the Council, and to others who have rendered special services, to the Federal and other officials whose names appear in the accompanying list and to the medical, pharmaceutical and other publications listed on the accompanying pages. I would also suggest that you send complimentary copy to the leading pharmaceutical journals of Mexico."

Chairman Lascoff approves the list for complimentary copies. The list referred to calls for approximately 60 complimentary copies and 60 review copies.

(*Motion No. 7*) It is moved by DuMez that complimentary and review copies of the Recipe Book II be sent to those persons and publications mentioned on the lists referred to above. It is important that the review copies be sent out as promptly as possible and therefore a vote is called for on this motion at this time. If there is objection or any additional information is desired, the vote will be considered as tentative.

37. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 61, Alphonse John Meyer, 4015 Three Mile Drive, Detroit, Mich.; No. 62, Alfrieda Zinser, Methodist Hospital, Sioux City, Iowa; No. 63, Charles Reynolds Rhodes, Arcade Building, Hyndman, Penna.; No. 64, William de Neergaard, 454 Fifth Ave., Brooklyn, N. Y.; No. 65, Rudolph Durnwirth, 374 North Ave., New Rochelle, N. Y.; No. 66, Isidore Wilson, 77 W. 181st St., New York, N. Y.; No. 67, Gilbert Clyde Harris, 1015 W. Fifth St., Charlotte, N. C.; No. 68, Joseph A. Shibel, Gardner State Hospital, East Gardner, Mass.; No. 69, Nellie Perry Watts, 427 S. 45th St., Philadelphia, Pa.; No. 70, Perry Matsuura, 2107 Pine St., San Francisco, Calif.; No. 71, Harry K. Iwamoto, No. 2 Cottage Row, San Francisco, Calif.

(*Motion No. 8*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

EDISON MEMORIAL.

"An Eternal Light" is to be erected as a memorial to Thomas A. Edison at Menlo Park, N. J. It will rise 135 feet in the air, with a giant electric bulb on its summit. In this connection it is of interest to refer to Sir Joseph Swan, British pharmacist, in connection with the work of Edison.—See page 1244, November JOURNAL, 1931, and December issue, 1931, page 1253. See "A Memoir of Sir Joseph Wilson Swan," London, 1929, 183 pages.

Photograph of A. PH. A. Recipe Book II Display.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.*

CORRECT COLOR NAMES FOR PHARMACEUTICALS.

Under this title the AMERICAN PHARMACEUTICAL ASSOCIATION had an exhibit at the annual meeting of the American Association for the Advancement of Science at Atlantic City during the week of December 28th. The exhibit illustrated the unique work being done at the National Bureau of Standards in Washington under a research grant of the A. PH. A. Committee on National Formulary and was in charge of Dr. Deane B. Judd of the Bureau.

The purpose of the work is to standardize the color terms used to describe official drugs and pharmaceuticals and to establish simple, easily understood and usable color names on a scientific basis which will give them legal standing and make them valuable for all types of analytical work. It is also expected that the work will lead to greater uniformity in the color of prepared drugs and medicines and will eliminate to a great extent, at least, the difficulties resulting from variations in color.

* From *Bulletin* No. 9, AMERICAN PHARMACEUTICAL ASSOCIATION.

"The question of color nomenclature is complicated by the fact that there are 100,000,000 distinguishable colors, of which some 10,000,000 are producible by dyes and pigments, and for which in the new system there are 500 color names. Each name, therefore, refers to a range of color rather than to a single color," according to Dr. Judd.

"The new system of color designation," he explains, "consists of literally joining the two ends of the spectrum to make a complete circle forming the equator of the color solid, allocating the chief hues and then charting off the remaining hues in much the same manner as points on the compass are marked. Reference to a particular color name, therefore, can be immediately checked with the color solid and reproduced identically."

The new system of color nomenclature is based on recommendations of the Inter-Society Color Council. It is designed to provide exact, scientific descriptions of colors for pharmaceutical workers, including both manufacturing and retail pharmacists in their task of compounding drugs and medicines for the prevention and treatment of disease, and promises to replace the present haphazard method of color naming.

The necessity for greater accuracy in determining and naming colors in pharmacy has become more apparent as the standards for drugs have become more definite. Dr. E. N. Gathercoal, chairman of the National Formulary Committee, organized a Color Convention in Washington, D. C., about six years ago which was attended by scientific and industrial color authorities. The group organized the Inter-Society Color Council with Dr. Gathercoal as the first chairman, and the problem of designating the color of drugs was the first to be considered. Although the current study is confined to drugs and medicines, the system is sufficiently standardized as to have a profound effect upon the many sciences, arts and industries concerned with determining and naming colors.

(N2) SUB-SECTION ON PHARMACY.

The Association also arranged the following program for the meeting of this Sub-section which is a division of the Section on Medical Sciences for Monday, December 28th, at 10 A.M. in the Vernon Room of Haddon Hall, Atlantic City:

1. "Some Observations on the Bioassay of Digitalis Preparations," Marvin Thompson, University of Maryland, School of Pharmacy.
2. "The Quantitative Determination of Small Quantities of Chloride and Sulfate Ions in Aqueous Solution by Electrical Conductivity," Richard E. Houghton and Arthur Osol, Philadelphia College of Pharmacy and Science.
3. "The Metabolism of Adrenalectomized Rats," C. Jelleff Carr and Frances Beck, University of Maryland, School of Medicine.
4. "The Pharmacognosy of the Parathyroids," Heber Youngken, Massachusetts College of Pharmacy.
5. "Studies on a Liver Preparation Which Protects against Certain Liver Poisoning," J. C. Forbes, Medical College of Virginia.
6. "The Pharmacy of Antacids," Alfred Barol, Philadelphia, Pa.
7. "The Detection of Cannabis Sativa," J. C. Munch, H. W. Mantz and H. J. Pratt, Temple University.
8. "Further Studies on the Sugar Alcohols," J. C. Krantz, Jr., C. Jelleff Carr and Frances Beck, University of Maryland, School of Medicine.
9. "Berries of the Matrimony Vine (Lycium *halmifolium* Mill.)," Arno Viehoever, J. F. Oakley and Joe Coletta, Philadelphia College of Pharmacy and Science.

Dr. John C. Krantz, Jr., Baltimore, Md., was chairman for this session and Dr. Arthur Osol, Philadelphia, Pa., the local secretary.

Through the Sub-section on Pharmacy and the annual exhibit, the AMERICAN PHARMACEUTICAL ASSOCIATION is bringing the basic scientific work being done in Pharmacy to the attention of the more than 16,000 leading scientists who are members of the American Association for the Advancement of Science.

Best Wishes for Health and Prosperity, 1937

EDITORIAL NOTES

NEW SYSTEM OF NAMING COLORS.

The new system of naming colors was referred to in the report of the meeting of the American Association for the Advancement of Science. It will provide a definite, accurate measurement of color strength and tone. It was exhibited by the AMERICAN PHARMACEUTICAL ASSOCIATION at the annual meeting of the American Association for the Advancement of Science held at Atlantic City, N. J., during the week of December 28th. The new color names are simple, easily understood and usable and are based on a logical, scientific basis which gives them a legal standing and makes them valuable for many types of analytical work. The system is based on the use of the basic terms red, yellow, green, blue and purple with the component hues orange, pink, brown and olive, the modifiers faint, pale, light, brilliant, weak, vivid, strong, dusky, dark and deep, and the adverb *very*. The resulting terms such as "very dark blue," for example, would relate to a definite standard of color rather than to the color education of an individual observer as is now the case. Indefinite names ending in "ish" such as reddish, yellowish, etc., have been eliminated except as modifiers of definite names; such as reddish purple, yellowish green, etc.

The new system is the result of research being conducted at the National Bureau of Standards, at Washington, D. C., under the direction of Dr. Deane B. Judd and by Mr. Kenneth L. Kelly, research associate, under a National Formulary research project of the AMERICAN PHARMACEUTICAL ASSOCIATION which is sponsoring the work as a means of standardizing the color names used to describe official drugs and pharmaceuticals used in the treatment of disease.

PAN-AMERICAN RELATIONS.

An era of friendlier political and trade relations among American countries appears certain to result from the conference in Argentina. Cordell Hull, Secretary of State, cabled his best wishes for the success of the Greater Texas and Pan-American Exposition to be held in Dallas in 1937, which will celebrate the achievement made at Buenos Aires.

The Pan-American health directors convened in Washington last April evidenced the value of the meetings with our neighbors and speaks for the opportunities that developed in Argentina and the possibilities that will result from these conferences. (See April JOURNAL, page 277.)

PRODUCTION OF IODINE.

Prior to 1932, this country was dependent on a foreign monopoly for its supply. A recent comment on a report of the Chemical Division of the Department of Commerce indicates that this country has recently assumed a leading position in the production of iodine. During 1935 the sale of this element by producers amounted to 245,700 pounds, and for the past four years it has averaged 276,500 pounds annually. The source of the iodine is salt brine and the waters from oil wells, the most successful projects being located in California. This rapid industrial chemical development has raised the United States from an essentially dependent nation as concerns iodine to the world's second largest producer.

UNIVERSITY OF MINNESOTA.

Plans are under way for a pharmacy institute of three days, to be given in connection with the Center for Continuation Study at the University of Minnesota. This Institute will be held on February 15, 16, 17, 1937.

THE HOSPITAL LABORATORY.

The laboratory of a hospital should be a separate unit both in a scientific and economical sense, and should be placed when possible in some ideal central spot among the wards from which it gets its material for examinations. It must naturally be subdivided into biochemical, microscopic, bacteriological and serological departments, as well as for anatomical and pathological investigations, the last in the immediate neighborhood of the mortuary. The outfit of instruments and material for use must be ample, having regard to reasonable economy, since the unique nature of investigations must be carried out quickly, accurately and strictly scientifically in the interests of the diagnosis and the dependent treatment. The laboratory of a large hospital must be in a position to carry out every investigation required for fixing a diagnosis. It must not, however, even though its aims are purely practical, limit itself to a daily routine, but of its own initiative take part in the steady development of science. Through the investigations of the causes of disease the laboratory serves not only curative but preventive medicine.—From *Nosokomeion*—Or-

FICIAL ORGAN OF THE INTERNATIONAL HOSPITAL ASSOCIATION.

OILY PREPARATION OF ACRIFLAVINE.

Acriflavine (neutral)	1 Gm.
Colloidal kaolin	20 Gm.
Wool fat	30 Gm.
White beeswax	50 Gm.
Ti-tree oil	10 mils.
Oil of lemongrass	1 mil.
Distilled water	250 mils.
Sterilized liquid paraffin	740 mils.

Aseptic precautions are observed and non-volatile ingredients are sterilized by heating. The kaolin is placed in petri dishes and sterilized in the hot air oven. It is too early to say much about clinical results, because the preparation has only been in use for a few weeks.

In the oil-in-water type of emulsion there is a choice of several formulas. The emulsifying agent is usually the soap of a monovalent metal or group, and consequently the acriflavine is in the continuous phase. Those emulsions prepared with solutions of ammonia or potassium hydroxide need care in making in order to avoid irritation caused by excess alkali. The use of this type of preparation looks like increasing sufficiently to warrant a formula being included in the next issue of the (British) Codex. —*Pharmaceutical Journal*, December 12, 1936.

AT THIS SEASON OF THE YEAR.

Tuberculosis blindness, maternal health, child welfare, crippled children, cancer, the American Red Cross enlist the public-spirited and sympathetic men and women to lend their support for efforts in correcting the growing afflictions. In every instance the need for help is urgent and very real and should have the support of all, so that the burden may not fall on the few. It requires and should have not only financial aid, but a better understanding of how the number of cases may be reduced and conditions improved.

It is stated that cancer took more than 140,000 lives in the United States and estimated that there are between three and five thousand sufferers alive to-day, perhaps, half of them might be saved if knowledge of the signs and symptoms which might mean early cancer were given to them and if they were strengthened by courage to act on that information without delay.

MENACE AND DANGER.

There are other diseases and dangers of infection that Surgeon General Parran is bringing to the attention of the public and are not in the foregoing classes; they have no place in that connection, but they are a menace and danger. It may be said, these conditions should not obtain, but they do; right or wrong, in every possible way there should be correction.

THE HOME MEDICINE CABINET.

"A Booklet entitled 'The Home Medicine Cabinet' was issued December 26th, by the Consumers' Project, a WPA activity under the supervision of the Department of Labor.

"The booklet, which consists of twenty-two pages, makes no reference to the products of any particular manufacturer, and is devoted chiefly to listing the essentials of a home medicine cabinet and describing their use. Principal products listed include an antiseptic, application for burns, pain-reliever, laxative, emetic, stimulant, toothbrush, dentifrice, gauze.

"Antiseptics recommended are iodine, boric acid and rubbing alcohol, and a few first-aid instructions in dressing a small wound are included. Laxatives approved are mineral oil, agar emulsion, cascara sagrada, milk of magnesia, sodium phosphate and castor oil. There is a caution about depending too much on laxatives and a warning against laxatives containing phenolphthalein or strychnine. Aspirin is described as 'the least harmful drug for use in the self-treatment of pain,' and consumers are warned against certain pain remedies.

"A formula for making tooth-powder in the home is given, and consumers are told that a dentifrice should do nothing more than clean the surface of the teeth. Salt water is recommended as the best mouthwash.

"The booklet frequently refers to publications of the American Medical Association and refers the reader to that organization or to the United States Food and Drug Administration for further information or lists of drugs containing ingredients mentioned."—From an article in *Oil, Paint and Drug Reporter* of December 28, 1936.

THE TREATMENT OF MALARIA.

"The multiplicity of therapeutic agents now available for the treatment of malaria and the conflicting claims of efficiency made for them create much therapeutic confusion. To date the most authoritative consideration of the question is the report of the Malaria Commission published in the *Quarterly Bulletin of the Health Organizations of the League of Nations*. The extensive review of the action and value of

the various drugs embodied in this report is based on numerous laboratory and clinical observations. The status at the time of the report is summarized thus: The new synthetic remedies now available are still in the experimental stage, and they (members of the commission) consider that the time has not yet come when any of these drugs can be recommended as substitutes for, or in preference to, quinine and other preparations of cinchona bark. The commission believed that quinine is effective for the purpose of clinical prophylaxis and that it remains the best drug to use. It is not good practice, according to the commission, to treat attacks of malaria in the acute stage with more than one of the specific drugs available. For treatment of an acute attack of benign tertian and quartan malaria, quinine and atabrine seem to be about equally effective. Atabrine, however, is definitely superior to quinine for the treatment of acute attacks of malignant tertian malaria. For the treatment of relapses the commission felt that no drug or combination of drugs seems yet to be available which will sterilize all the parasites in the human host and thus prevent the possibility of relapse. Plasmochin, unlike quinine and atabrine, has a powerful action against the gametocytes of malignant tertian malaria. The problem therefore retains some characters of confusion, much of which, however, can be eliminated by knowledge of the indications and limitations of the more widely used preparations."—*Journal A. M. A.*, November 14, 1936.

PERSONAL AND NEWS ITEMS.

Dr. David Hooper and Mrs. Hooper will celebrate the 50th anniversary of their marriage on January 19th. They were married in 1887 at Woodbourne, Catacamund, South India. Mr. Hooper was elected to honorary membership in the AMERICAN PHARMACEUTICAL ASSOCIATION in 1899; his work in the chemistry of drugs while in India was outstanding. He was quinologist to the Government of Madras, India, 1884–1897, curator of Industrial Section, Indian Museum, Calcutta, 1897–1912, Economic Botanist to the Government of India, 1912–1914. He received the Hanbury Medal in 1907, was president of the British Pharmaceutical Conference in 1916. Dr. Hooper is in charge of the collection of Materia Medica specimens in the Wellcome Historical Medical Museum. We extend best wishes to the celebrants.

CENTENARY OF THE BIRTH OF CHARLES F. CHANDLER.

Celebrations are planned by Columbia University and by chemical, civil and industrial groups to commemorate the 100th anniversary of the birth of Professor Charles Frederick Chandler, for sixty-one years a member of the faculty of Columbia, the father of the American Chemical Society, and one of America's first great industrial chemists.

Charles F. Chandler became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1867. A sketch may be found on page 227 of the March JOURNAL for 1917 and in September JOURNAL for 1925, page 849.

DOHME LECTURE.

Prof. Solomon Lefschetz, of Princeton University, delivered the first of the Dohme lectures this year. The subject of the lecture was "What Is Topology?" and delivered in Remsen Hall, the Johns Hopkins University. The speaker was introduced by Dr. A. R. L. Dohme, sponsor of the series of lectures, founded in memory of his father, Charles E. Dohme, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION and outstanding in its activities. ("Topology" is a relatively new branch of higher geometry.)

Dr. John Howard Northrop of the Rockefeller Institute for Medical Research will receive the Charles Frederick Chandler Medal. He was cited for fundamental discoveries concerning bacteria, the constitution of the protein and the chemistry of digestion. The medal was founded in 1910 to honor Professor Chandler.

P. M. Gross, Chairman of the Department of Chemistry of Duke University, stated, December 12th, in an address at the University of Richmond that the nicotine in tobacco could be reduced without greatly changing the aromatic qualities of tobacco.

The AMERICAN PHARMACEUTICAL ASSOCIATION has received from Mrs. Alice L. Braunworth a copy of the fiftieth anniversary number of the *Druggists Circular* and a copy of the *Western Druggist* containing a group picture of the A. PH. A. at Chicago, September 7, 1869. This number also contains prints of a large number of pharmacists.

A. A. M. Dewing, Centreville, Md., has favored the ASSOCIATION with a copy of an Association Song "Dear Ol' M. P. A.," words and music by him and is affectionately dedicated to the members of Maryland Pharmaceutical Association and T. A. M. P. A.

"Ecstasy" (waltz), words and music by A. A. M. Dewing and Margaret A. Dewing and "Pharmacy" (a parallel of the two dramatic arts—Music and Pharmacy) (words and music by A. A. M. Dewing), are respectfully dedicated to the AMERICAN PHARMACEUTICAL ASSOCIATION. Mr. Dewing, as indicated by the thought which prompted him in his contribution and its dedication, is a member of the ASSOCIATION.

Professor C. O. Lee's greeting is a musical number and he depicted the happy family in snow designs. The verse by Charles O. Lee, illustrated by Ruth, music edited and printed by Mama.

J. G. Beard, secretary-treasurer of the North Carolina Pharmaceutical Association, dean of the School of Pharmacy, and managing editor of the *Carolina Journal of Pharmacy*, has been granted a six months' leave of absence by the University beginning January 1, 1937.

Professor Beard is now in his twenty-eighth consecutive year of teaching at the School of Pharmacy; he is also in his twenty-fifth year of service as secretary-treasurer of the North Carolina Pharmaceutical Association. Professor Ira W. Rose has been appointed acting dean of the School and will serve in the capacity of secretary-treasurer of the state association.

Herbert Levy, a member of the Baltimore, Maryland Bar, has been appointed general counsel of the National Association of Retail Druggists to fill the vacancy created by the recent resignation of Governor J. A. O. Preus.

Prescott R. Loveland, secretary of New Jersey Pharmaceutical Association, and Mrs. Loveland were injured in an automobile accident. The secretary received a lacerated scalp, broken collar bone and other injuries; Mrs. Loveland was in the hospital for five days. Mr. Loveland also is out of the hospital and reports that they are getting along as well as could be expected.

UNLEARNING BUSINESS.

Edward A. Filene, president of Wm. Filene's Sons Company, of Boston, delivered an address on "Unlearning Business" at the University of Buffalo on December 9th. He closed his address by the following:

"The fact that one does not like this or that business theory is entirely irrelevant. Even though organized business and organized business teaching may still be unprepared to accept a new truth, that will not make it any the less true. Wrong principles are wrong principles, no matter how recently they may have become wrong principles; and the more we learn about how to do business upon wrong principles, the more it must unfit us for a successful business career."

OBITUARY.

HERMAN FRY.

Herman Fry, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1902, died at his home in Highland Park, Ill., December 3rd.

The deceased was born March 8, 1868, in Prussia and immigrated to United States in 1880. He attended public schools in Chicago and served his apprenticeship in the drug business in this city. In 1887, he was graduated from the Chicago College of Pharmacy and in 1889, he attended Rush Medical College for one year. Mr. Fry opened his first drug store in Chicago in 1890 and afterward developed a small chain of five drug stores, one of the first of such chains in Chicago.

He served the College of Pharmacy as a Trustee and Secretary and when the College was taken over by the University of Illinois, Mr. Fry became a member of the first Advisory Board. In 1904, he was president of Illinois Pharmaceutical Association and, in 1909–1910, president of the Chicago Drug Club. He was a former president of the Chicago Veteran Druggists' Association.

About ten years ago Mr. Fry retired from the retail drug business and gave his attention to his real estate holdings. In 1895, he was married to Miss Henrietta Franke, who survives him.

CORNELIUS OSSEWARD.

We are advised by Dean C. W. Johnson of the death of Cornelius Osseward on December 24th. The deceased was struck by an auto

while crossing a street in Seattle. He was a native of Holland.

Mr. Osseward became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1897. He was secretary of the Section on Practical Pharmacy and Dispensing, 1913–1914, and its chairman in the following year; for a number of years he was active in the work of the ASSOCIATION.

He served two terms as member of the Washington State Board of Pharmacy and did much to advance the educational standards of the State. For a number of years he conducted a professional pharmacy and in recent years, he has lived in retirement. Mr. Osseward was a graduate of Northwestern University and of the New York College of Pharmacy.

MISS MARY R. HAMILTON.

Miss Mary Rebecca Hamilton, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1922, and affiliated with the Rochester General Hospital, Rochester, Pa., for a quarter of a century, died July 8, 1936. She was born at Bridgewater, Pa., December 22, 1857, daughter of Alfred Hamilton and Elizabeth Stokes Hamilton. After attending the local schools, she studied at the old Pittsburgh Academy and the Edinboro State Normal. She taught in the schools of this section; later, she removed to Cincinnati, and was employed in the Tompkins Drug Store for a number of years and for a time owned and operated a pharmacy in Cincinnati. On account of her mother's health she returned to Beaver and accepted employment in the Martsolf Pharmacy, until named as pharmacist in the Rochester Hospital.

Miss Hamilton was deeply interested in charity work. For a number of years each Christmas she personally provided for the employment of a Santa Claus, who delighted both patients and nurses in the distribution of gifts, She was highly regarded as a pharmacist. We are indebted to her nephew, William A. Hamilton, for the data of this brief sketch.

F. H. HAINERT.

Frank Henry Hainert, member of the AMERICAN PHARMACEUTICAL ASSOCIATION and retired pharmacist at Hopkins, Minn., died March 4, 1936. He was born in Sheboygan, Wis., May 15, 1862, and settled in St. Paul in 1883. Here, he opened a pharmacy and was also the owner of a drug store in Minneapolis, both stores were for a number of years the largest in Minnesota. In 1923, he opened a pharmacy in Hopkins. He was a charter member of the State Veteran Druggists' Association, active in Westminster Presbyterian Church in Minneapolis and in the Masonic bodies.

Mr. and Mrs. Hainert were married in 1883, the latter and two daughters survive the deceased.

William S. Elkin, Jr., who was president of the National Association of Retail Druggists in 1908, died in his home in Decatur, Ga., November 27th, after a long illness. He was sixty-seven years old. In 1890, with W. S. Watson, he opened a drug store in Atlanta, and this business grew to be one of the largest in the city. In recent years he was a field representative of the National Association of Retail Druggists.

SOCIETIES AND COLLEGES.

Dr. James Ewing, Memorial Hospital, New York, was honored with the John Scott Medal of the City of Philadelphia, for his research in classifying tumors. The founder of the medal was a pharmacist (chemist) of Edinburgh, Scotland, who died in 1816. (See JOURNAL A PH. A., May 1921.)

CANCER SYMPOSIUM.

The Section on Medical Science of the American Association for the Advancement of Science, held a symposium in seven sessions at its recent meeting in Atlantic City on "Cancer."

During the meeting in Atlantic City, December 29th to January 14th, members of the American Association for the Advancement of Science and its affiliated and associated societies were invited to hold a session in Philadelphia on Saturday, January 2nd.

The visitors were the guests of the American Philosophical Society, the Academy of Science and the Franklin Institute. In this connection a brief reference to the origin of the American Philosophical Society is made. This organization was started by Benjamin Franklin in 1727 and developed from a small Club, the "Junto."

THE CHICAGO RETAIL DRUGGISTS' ASSOCIATION.

The Chicago Retail Druggists' Association News has started a series of historical articles which make interesting reading matter of refer-

ences to the early history of Pharmacy. Three of these articles have now appeared: the first one on "Chinese Pharmacy;" the next on "The Egyptian Pharmacopœia and the Ebers Papyrus;" and the one in the issue of December 19th, on "Babylonian Pharmacy." It is to be hoped that this work will be continued and in that connection the suggestion is made that the sources to the references should be as complete as possible.

The Tile and Till has, from time to time, articles of historical interest. In the January issue there is "The Beginning of Pharmacy in America" by Edward M. Allen, which is the first of the series of condensed articles, tracing the evolution of Pharmacy in this country.

OFFICERS OF AMERICAN CHEMICAL SOCIETY FOR 1937.

President, E. R. Weidlein; *President-Elect*, Frank C. Whitmore; *Secretary*, Charles L. Parsons; *Treasurer*, Robert T. Baldwin; *Director-at-Large*, Willard H. Dow; *Director*, 4th District, Townes R. Leigh; *Director*, 6th District, Robert E. Swain.

NATIONAL DRUG TRADE CONFERENCE.

The National Drug Trade Conference held its 1936 meeting at the Mayflower Hotel, Washington, D. C., Tuesday, December 8th, President Carson P. Frailey presiding, and Rowland Jones, Jr., secretary. These officers were reëlected for the ensuing year, and also Vice-President A. C. Taylor. Among the subjects discussed were: National Food and Drug Legislation, National and State Fair Trade Acts, the National Social Security Act, Uniform State Narcotic Acts, the General Status of Pharmacy and Drug Trade, Distribution of Drugs and Medicines, the educational status of pharmacy, etc.

ARIZONA PHARMACEUTICAL ASSOCIATION.

Arizona held its annual convention at Phoenix, November 18th–20th. The registrations run over 350 in attendance; Arizona has 150 drug stores.

The officers elected for the ensuing year are: *President*, N. W. Stewart, Phoenix; *First Vice-President*, L. R. Johnson, Tucson; *Second Vice-President*, W. C. Denson, Mesa; *Treasurer*, I. V. Kisseberth, Phoenix; *Secretary*, N. S. McCallum, Phoenix.

NEW HAMPSHIRE PHARMACEUTICAL ASSOCIATION.

J. Albert Nault, of Concord, is now the secretary of New Hampshire Pharmaceutical Association. **George A. Moulton,** of Peterboro, is the president and **Charles E. Green,** of Pittsfield, vice-president, is in charge of legislation.

WISCONSIN PHARMACEUTICAL ASSOCIATION.

The 55th annual convention of the Wisconsin Pharmaceutical Association will be held June 23rd–24th, in Manitowoc. Local druggists will meet early in January to appoint a committee to help arrange for the event.

TEXAS PHARMACEUTICAL ASSOCIATION.

The Executive Committee of Texas Pharmaceutical Association recently met in Austin. El Paso was chosen as the host city for the 1937, June 14th–17th meeting. An effort will be made to arrange for a tri-state meeting of Arizona, New Mexico and Texas.

The president was authorized to contract with Walter D. Adams, as editor of *The Texas Druggist*, for a term of five years.

The Executive Committee approved a legislative program including a State Fair Trade Bill, State Prophylactic legislation and an Anti-Substitution Measure. Carter Sommers, San Antonio, is chairman of the legislative committee; other members are Miss Villa Saunders and E. M. Joseph of Austin.

REORGANIZATION OF PHARMACY IN BELGIUM.

Belgian pharmacists recently held a meeting under the joint chairmanship of M. R. Pattou, president of the Nationale Pharmaceutique, and M. A. Hendrix, president of the Algemeene Apothekers Vereeniging. Seven hundred of the two thousand pharmacists practicing in Belgium met to consider a lengthy agenda which had as its main object the more complete organization of pharmacy in Belgium as an autonomous profession. Some of the points considered and agreed upon were:

The creation of a "pharmaceutical order," which would make pharmacy an absolutely autonomous profession.

A control of all pharmacies which were not actually owned by a pharmacist with the object of ensuring that those at present in exis-

tence should only be allowed to continue in the case of pharmacies belonging to the orphans or widows of pharmacists.

A limitation of the number of pharmacies.

Enforcement of the existing agreement stabilizing the prices of proprietary medicines.

A reduction of the number of non-graduate employees in proportion to the number of graduate pharmacists, in certain instances.

It was urged that a better understanding and more collaboration should exist between pharmacists and medical practitioners.

ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Professor George David Birkhoff, of the Graduate School of Arts and Science, was elected president of the American Association for the Advancement of Science. The subject of his address was "Conceptual Theory of Atomic Theory."

In his concept of the atom, arrived at by pure mathematics, the "building blocks of the universe" seem to behave like tanks containing two different kinds of what he terms "perfect fluids," consisting of positive electricity, or the proton, and negative electricity, or the electron.

HISTORY OF COSMETICS.

The Evening Star, Washington, has been publishing a series of articles by Gail Renfrew on the history of cosmetics. In the issue of November 28th is the 5th of the series, on Sir Hugh Plat's book, published in London, 1632. The cover design was published by courtesy of the Rare Book Room, Library of Congress. The wording reads "Delights for Ladies to Adorne Their Persons, Tables, Closets and Distillatories with Beauties, Bouquets, Perfumes and Waters." It was among the first of its kind to contain printed directions for making beauty aids.

MARIHUANA FARM.

A well-planned and highly cultivated marihuana farm, disguised to look like a cornfield, was recently discovered at the eastern edge of Baltimore, by police and Federal agents.

Describing the farm as "one of the biggest ever found in this country," the plants bearing the narcotic leaves were much larger than the usual bushes grown in this country, and the two acres of land had evidently been well worked and fertilized.

Some time ago a field of marihuana was found growing in New York, but the agents said that the Baltimore field was much larger.

A FEW POINTS OF SOCIAL SECURITY TAX.

The tax covers part-time as well as full-time employees.

The employer is to file monthly returns with the Collector of Internal Revenue and the taxes will be payable monthly.

The employee tax is to be collected by the employer by deducting it from the pay of the employee.

From January 1, 1937 to December 31, 1939, the employee will be required to pay a tax equal to one per cent of his pay, with the employer matching this sum.

The tax rate increases to one and one-half per cent for the next three-year period and an additional one-half per cent for each three-year period thereafter until the maximum rate of three per cent is reached on January 1, 1949.

A person becomes eligible for old-age benefits at the age of 65, provided he is retired at that age and provided further that he has received a minimum of $2000.00 in total wages between December 31, 1936 and the time he reaches the age of 65.

The minimum old-age benefits to be received are $10.00 a month; the maximum is $85.00 a month and will be payable only to those who have earned a minimum of $3000.00 a year for at least 45 years.

If an employee dies before reaching the age of 65, his estate will receive a sum equal to three and one-half per cent of the total wages earned between December 31, 1936 and the date of his death.

The first old-age pensions will be paid beginning January 1, 1942.

PROGRESS IN MEDICAL SCIENCE.

Surgeon General Aldo Castellani, inspector general of Italian military and civil medical services in East Africa during the hostilities, added to his fame. The renowned expert in tropical diseases holds the chair of tropical diseases at Tulane University, in New Orleans, and is visiting lecturer at the London School of Tropical Medicine.

It is said there was not a single case of smallpox, plague, cholera, typhus or scurvy reported among the Italians, against this there were 20,000 cases of typhus among the Ethiopian forces and 30,000 cases of scurvy. Dr. Castellani drew on knowledge belonging to the whole world and indicates the progress made in the science.

BOOK NOTICES AND REVIEWS.

The following *reprints* have been received from B. E. Read, Division of Physiological Sciences, Henry Lester Institute of Medical Research, Shanghai.

"The Fluorine Content of Some Chinese Food Materials," E. Reid.

"The Effect of Donkey Skin Gelatin (Ah-chiao) upon Nutritional Progressive Muscular Dystrophy," T. G. Ni.

"Chemical Examination of Chinese Remedies for Nightblindness," Peter G. Mar and B. E. Read.

"The Variation of Vitamin C Content in Certain Fruits and Vegetables," by H. C. Hou.

"The Anthelmintic Action of Propyl Guaiacol," by C. Pak and B. E. Read.

"The Antipyretic Action of a New Antipyrine Derivative," C. L. Yi and B. E. Read.

"The Formation and Distribution of Vitamin C in the Germinating Pea, *Pisum Sativum* L." (Blue Bantam Variety), by W. Y. Lee.

"Vitamin C and Its Relation to Diseases," H. C. Hou.

"The Destruction of Ascorbic Acid in Water," by Hsiang-Chuan Hou.

"The Relation between the Antiscorbutic Activity and the Mode of Administration of Ascorbic Acid," by H. C. Hou.

"The Effect of Light on the Production and Distribution of Ascorbic Acid in Germinated Soy-Beans," by W. Y. Lee and B. E. Read.

Toxicology or the Effects of Poisons. By FRANK P. UNDERHILL, Ph.D., late Professor of Pharmacology and Toxicology, School of Medicine, Yale University. Third edition, thoroughly revised by Theodore Koppanyi, Ph.D., Professor of Pharmacology and Materia Medica, cloth, pages xiii + 325, 20 x 14 cm. Price, $2.50. P. Blakiston's Son and Co., Inc. Philadelphia, 1936.

Pharmacologists and toxicologists of this country will welcome the appearance of the third edition of Professor Underhill's concise and trustworthy guide in toxicological practice. This is especially true since its revision has been undertaken by Professor Koppanyi, whose experience eminently qualifies him to continue this work.

The original form and text, as far as compatible with the advance in Toxicology have been retained by the reviser. The book is divided into six general headings. The first treats of general toxicological concepts; the second discusses inorganic corrosive poisons; the third embraces poisonous gases; the fourth includes metallic poisons; in part five, the alkaloidal poisons are discussed and the sixth division is concerned with a large number of miscellaneous organic poisons.

The general arrangement of the subject matter under the individual poisons is more or less uniform, consisting of the origin of the poisoning, symptoms, mechanism of poisonous action, fatal dosage, post-mortem appearances and treatment. That this subject matter is abreast of modern scientific toxicology is evidenced by the fact that, under mercuric chloride the sodium formaldehydesulfoxylate treatment is given; under cyanide poisoning, the nitrite-thiosulfate antidotal measures are included and the modern accepted dosage of picrotoxin in barbituric acid derivative-poisoning is discussed. The reviewer regrets, however, that the mechanism of the action of these antidotes is not included.

Pharmacologists and toxicologists know this useful volume and have it as a part of their armamentarium, but besides it should be a part of the library of every pharmacy, ranking next in importance to his national standards. With it he may save a life.—JOHN C. KRANTZ, JR.

TRAFFIC IN OPIUM AND OTHER DANGEROUS DRUGS FOR THE YEAR 1935.

The comprehensive report by H. J. Anslinger, U. S. Commissioner of Narcotics, covers the year ending December 1935. The Commissioner states that a problem which has proved most disquieting to the Bureau during the year is the rapid development of the wide-spread traffic in Indian Hemp (Marihuana). Attention is called to the fact that over 195 tons of this drug in the form of planks, flowering pots and cigarettes had been confiscated and destroyed by the various states during 1935. The Commissioner states that it is noteworthy that for every agent in the government field service there are ten convicted narcotic violators in the federal prisons. A situation which has caused the narcotic administration grave concern is the one in the far East relating to the narcotic problem. There is a possibility, to an alarming degree, of inundating the Western World with narcotics if more adequate steps are not taken to curb the traffic.

MERCK PRESCRIPTION CHEMICALS

Confidence!

PHARMACISTS' hands—experienced hands! Every day, everywhere, the hands of experienced pharmacists reach more often for bottles of Merck Prescription Chemicals than for any other brand.

Habit has something to do with it, of course, because habit is, as it were, a second nature. And the containers themselves encourage frequent use because they are attractive, uniform, practical, and convenient to handle.

But after all, the real reason for this widespread and growing preference for Merck Prescription Chemicals among American pharmacists may be summed up in a single word—*Confidence*. They know that the Merck label is a guaranty of purity and reliability.

MERCK & CO. Inc. *Manufacturing Chemists* RAHWAY, N. J.

VITAMIN THERAPY SCIENTIFICALLY PLANNED

NATOLA

HALIVER OIL FORTIFIED WITH *natural* VITAMIN D

For Physician and Patient:

POTENCY—Each capsule represents the average daily adult prophylactic dose recommended by outstanding authorities. One capsule, or ten drops (3 minims) of the liquid, is equal in natural vitamins A and D to three teaspoonfuls of cod-liver oil of N. N. R. standard.

BALANCE—Natola presents vitamins A and D in the preferred ratio; each gram contains 55,000 U. S. P. units of vitamin A and 5500 U. S. P. units of vitamin D (natural).

ECONOMY—Natola represents a most economical source of vitamins A and D; it is available to patients at prices which make possible continuous treatment at moderate expense.

For the Druggist:

PROFITABLE VITAMIN BUSINESS—Natola, a unique product possessing all these features, offers an excellent opportunity for large-volume sales; the low price schedule affords substantial profits.

•

	Net Prices
NATOLA LIQUID	
10-cc. vials, with dropper, per dozen	$ 5.10
50-cc. bottles, with dropper, per dozen	17.85
NATOLA CAPSULES (No. 217)	
Boxes of 25, per dozen	5.61
Boxes of 50, per dozen	10.20
Boxes of 100, per box	1.49

PARKE, DAVIS & COMPANY • Detroit, Michigan